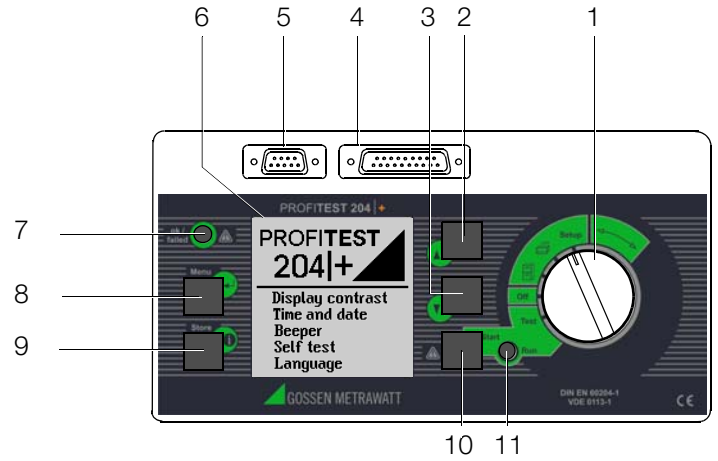
GOSSEN METRAWATT

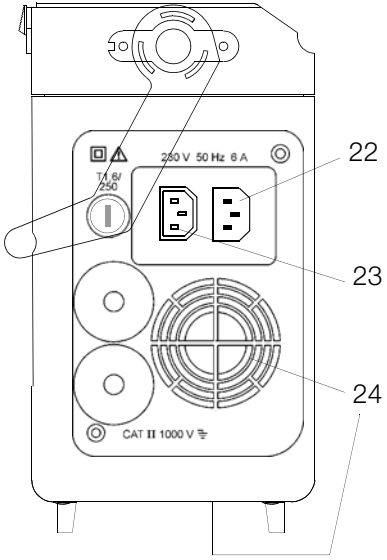
PROFITEST 204 | +, 204 | L+, 204HP, 204HV

Test Instrument for EN 60204 / DIN VDE 0113

3-348-781-03
23/9.15

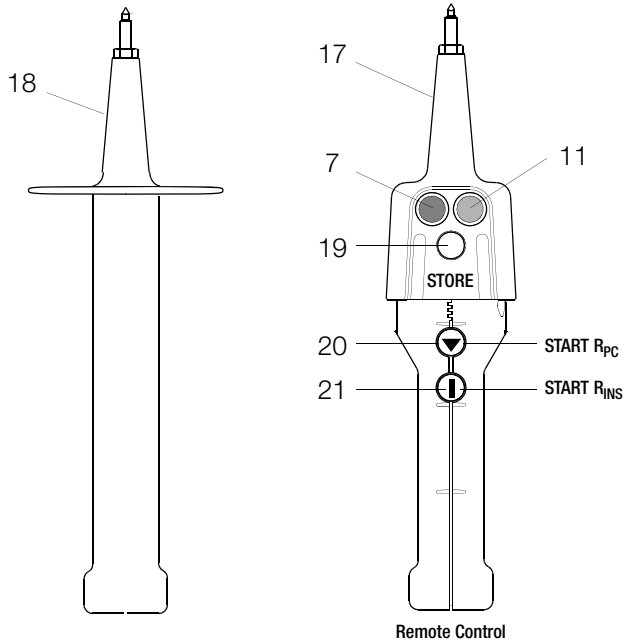
Test instrument may only be operated under supervision of a qualified electrician!





Connector Panel

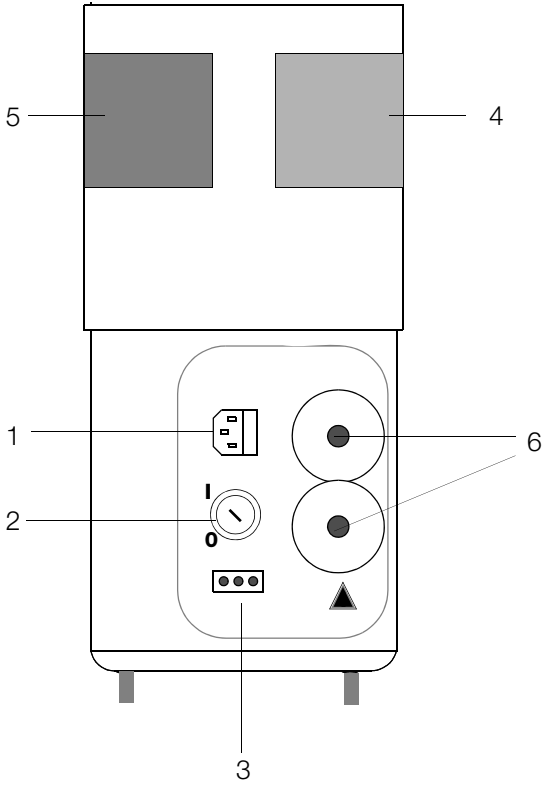
***PROFITEST 204+**: Basic Instrument*



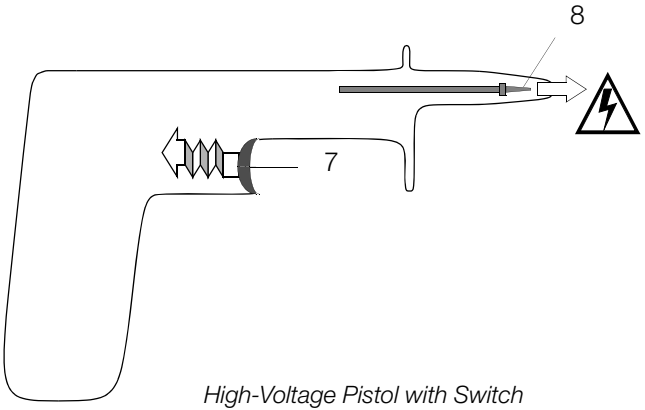
***PROFITEST 204+**: Test Probes*

1 Function selector switch
2 ▲ key
3 ▼ key
4 Printer port
5 Connector socket for RS 232 interface
6 LCD window
7 Signal lamp: test passed (green) / test failed (red)
8 MENU key
9 Help key / save key
10 Start key for selected test
11 Signal lamp “test in progress” (yellow)
12 Push-buttons (left and right) for releasing the handle from its snap-in position
13 Push-buttons (left and right) for releasing the lid
14 Lid
15 Accessory input module SECUTEST (P)SI (not included in standard equipment)
16 Carrying handle and tilt stand
17 Test probe with integrated controls
18 Test probe with integrated fuse
19 Key for saving measurement value
20 Key for starting protective conductor measurement
21 Key for starting insulation measurement
22 Mains connector
23 Power supply connector for high-voltage module (max. 6 A)
24 Ventilation slots

Attention!
The ventilation slots at the bottom of the housing (24) and in the connector panel of the basic instrument must remain unobstructed!



PROFITEST 204 HP/HV High-Voltage Module Connector Panel



High-Voltage Pistol with Switch

1 Inlet connector for power supply to high-voltage module with insert for fuse

2 Key switch for the prevention of unauthorized use

3 Terminals for external signal lamps (see chapter 3.1.3, page 15)

4 When green signal lamp is illuminated, high-voltage module is ready for operation

5 **When red signal lamp is illuminated**, high-voltage module is ready to be activated. **Caution, danger!**

6 Permanently attached measurement cable

7 Trigger (switch).
As opposed to high-voltage pistols without switch, the high-voltage switching pistol is identified with a red clamping ring on the connector cable underneath the handle.

8 Recessed safety test probe

Items Shipped with the Instrument

If you have two sets of operating instructions with different issue dates:
Use only the newest operating instructions.
The issue date appears on the title page underneath the order number (3-348-781-xx), e.g. 17/9.10 means: 17th revision, September 2010.

PC Program WinProfi for communication with PROFITEST 204+

The free PC starter software WinProfi* is used for communication with your **PROFITEST 204+** test instrument. WinProfi is available on our homepage with the following content and functions:

- up-to-date test instrument software
  – for loading a different language for the user interface
  – for loading an updated software version
- Transmission of measurement data from the test instrument to the PC
- preparation and modification of templates for test reports at the PC and transmission of the templates to the test instrument
- preparation, printout and filing of test reports at the PC

The following interface cables and/or converters are required for communication between test instrument and PC:

– Z3241	RS232 (tester*) – RS232 (PC)
– RS232-USB Converter (Z501L)	RS232 (tester*) – USB (PC)

* not possible via the RS232 terminal of a connected **SECUTEST SI+**

Up-to-date PC software (free of charge starter or demo software for data management, report and list generation) is available from our homepage for download.

* WinProfi is currently applicable up to Windows 7 (32 Bit)

Notes on SECUTEST SI+ Operating Instructions

The **SECUTEST SI+** module is used together with the **PROFITEST 204+** exclusively for entering comments at the alphanumeric keypad.

The following chapters from the operating instructions included with the **SECUTEST SI+** (3-349-613-15) are relevant for operation with the **PROFITEST 204+**:

- Chapter 2: Safety Features and Precautions
- Chapters 3.1 and 3.2: Inserting and activating the SI Module
- Chapter 10: Characteristic Values
- Chapter 11: Maintenance
- Chapter 12: Repair and Replacement Parts Service
- Chapter 13: Product Support

The following functions are **not active**, and are only sensible in combination with the SECUTEST... test instrument:

- Display and save reports
- Statistics
- Utilization in combination with a barcode scanner

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1 Applications

1.1 PROFITEST 204+

The **PROFITEST 204+** test instrument is used for quick and safe testing of electrical and electronic equipment and systems at machinery in accordance with DIN VDE 0113/EN 60204-1.

The following initial and periodic tests must be performed in accordance with these regulations:

- Testing for continuity of the protective conductor circuit with a test current of at least 10 A
- Insulation resistance test
- Voltage test (optional PROFITEST 204HP/HV)
- Testing for residual voltage

Beyond this, other tests can be performed which are not required for the safety of electrical equipment at machinery, but which nevertheless supplement the instrument in a practical fashion:

- Measurement of electrostatic discharge capacity for floor coverings in accordance with DIN 51953
- Leakage current test for the substantiation of the absence of voltage
- Voltage and frequency measurements

All values required for approval reports can be measured with this instrument.

The optional **SECUTEST SI+** module (an input module which can be set into the lid of the instrument and which is equipped with an integrated interface and keypad) expands the applications range of the **PROFITEST 204+**.

All measured data can be archived with the measuring and test report which can be printed out directly or at a PC. This is especially important where product liability is concerned.

1.2 PROFITEST 204L

The **PROFITEST 204L** test instrument has been furnished with an extra-long measurement and control cable, allowing for comfortable use at large machines and machine components.

Please note that use of the LEADEX 204 extension cable is only possible to a restricted extent as a result of this extra-long measurement cable.

Due to the additional, relatively high ohmic resistance of the LEADEX 204 extension cable, the minimum test current of 10 A AC as specified by EN 60204 may be fallen short of under certain circumstances, causing the instrument to abort the test and display a corresponding message. As a rule, this does not occur during use of the LEADEX 204 extension cable until protective conductor resistance at the device under test has reached a value of 200 mΩ or greater. This effect may even occur with relatively low line voltage values (less than 210 V).

If you require longer measurement cables than those supplied with the **PROFITEST 204L** for your application, we recommend the use of extension cables with a significantly larger cross-section.

Our product support team (see address on page 74) would be happy to assist you with any questions you may have.

Attention!

Protective conductor and high-voltage test

It is imperative that the measuring cables are completely unwound prior to starting the tests.

2 Safety Features and Precautions

This instrument fulfills the requirements of the applicable European and national EC guidelines. We confirm this with the CE marking. The relevant declaration of conformity can be obtained from GMC-I Messtechnik GmbH.

The **PROFITEST 204+**, 204 HP and 204 HV test instruments have been manufactured and tested in accordance with the following safety regulations:

IEC 61010-1 / DIN EN 61010-1 / VDE 0411-1,
DIN VDE 0413, part 1, and EN 60204 / DIN VDE 0113

If used for their intended purpose, the safety of the user, the instrument and the device under test is assured.

Read the operating instructions thoroughly and carefully before using your instrument, and follow all instructions included therein.
Make sure that the operating instructions are readily available to all operators.

Observe the following safety precautions:

- The instrument may only be connected to electrical supply systems with 230 V/240 V which conform to the valid safety regulations (e.g. IEC 60364, VDE 0100) and are protected with a fuse or circuit breaker with a maximum rating of 16 A.
- Be prepared for the occurrence of unexpected voltages at devices under test (for example, capacitors may be dangerously charged).
- Make certain that connector cables, measurement cables and test cables are in flawless condition, e.g. no damage to insulation, no interruptions in cables or plugs, no kinks etc.
- Impulse withstand voltages of up to 2.5 kV may occur in overvoltage category II systems with 230/400 V.

The PROFITEST 204+ basic instrument and the PROFITEST 204HP and HV high-voltage modules may not be operated:

- If visible damage is apparent
- If connector, measuring or test cables are damaged
- If they no longer function correctly
- If the signal lamps are defective
- If the functions test is not passed (see chapter 4.5.1, page 35)

In such cases, the instrument must be removed from service and secured against unintentional use. Send the instrument to the Repair and Replacement Parts Service Department (see chapter 13).

Opening of Equipment / Repair

The equipment may be opened only by authorized service personnel to ensure the safe and correct operation of the equipment and to keep the warranty valid. Even original spare parts may be installed only by authorized service personnel.
In case the equipment was opened by unauthorized personnel, no warranty regarding personal safety, measurement accuracy, conformity with applicable safety measures or any consequential damage is granted by the manufacturer.

Data Backup

The measurement, report and input data are stored and secured in the test instrument RAM as long as the associated battery supplies the required voltage. Please note that the data will be lost during a software update. We therefore advise you to regularly transmit your stored data to a PC in order to prevent potential loss of data in the test instrument. We assume no responsibility for any data loss. For data processing and management we recommend the following PC software programs:

- **ETC**
- **PS3** (documentation, management, report generation and monitoring of deadlines)
- **PC.doc-WORD™/EXCEL™** (report and list generation)
- **PC.doc-ACCESS™** (test data management)
- **ELEKTROmanager** for **PROFITEST 204+**

2.1 Meanings of Symbols

2.1.1 Symbols on the Instrument

The symbols on the instrument have the following meanings:

Indicates CE conformity

Warning concerning a point of danger,
(Attention, observe documentation!)

Report functions

Data management

This device may not be disposed of with the trash. Further information regarding the WEEE mark can be accessed on the Internet at www.gossen-metrawatt.com by entering the search term 'WEEE'.

2.1.2 Symbols in the Operating Instructions

Life endangering for the operator if instructions identified with this symbol are not observed

Danger for the operator and the instrument if instructions identified with this symbol are not observed

2.1.3 Symbols which Appear at the PROFITEST 204+ Display

**Warning concerning a point of danger,
e.g. voltage at the test probe is greater than 25 V**

Timer function, indicates test duration

Protective conductor and insulation measurement:
interference voltage present at the test probes

Indication that test current is less than 10 A during protective conductor measurement.

Indicates "all-clear" after insulation test:
voltage at the test probe is less than 25 V

Warning for leakage current test:
voltage may not exceed 250 V

2.1.4 Symbols which Appear at the Display of the PROFITEST 204HP/HV High-Voltage Module

Data management message:
data transmission successfully completed

Excessive temperature inside the test instrument (protective conductor test)
Allow instrument to cool down for approx. 10 minutes.

Internal temperature monitoring is defective.
Send the high-voltage module to the Repair Department at GMC-I Service GmbH.

This symbol appears after the measured voltage value has been frozen at the display (see chapter 4.4, page 33).

High-voltage module ready for activation

A **life endangering high-voltage** of up to **5 kV** is present at the test probes of the high-voltage module.

Test completed successfully:
residual voltage less than 25 V

The predefined limit value I_{MAX} has been exceeded. The current limiting function has switched the instrument to the stand-by mode.
It is entirely possible that the displayed value for I_T is less than I_{MAX}, because the last measured value is always displayed.

Instrument is defective! / Transmission between **PROFITEST 204+** and 204HP/HV interrupted.

Excessive temperature inside the test instrument (high-voltage test)
Allow instrument to cool down for approx. 10 minutes.

2.2 Special Safety Precautions and Instructions for the PROFITEST 204HP/HV High-Voltage Module

Precautions for the prevention of *unauthorized* activation:

- **Key Switch**

Precautions for the prevention of *unintentional* activation:

- **Multiple Key Operation:**
  It is only possible to activate test voltage with the trigger at the high-voltage pistol with switch, after pressing the start key at the basic instrument.
- **Two-Hand Operation:**
  Each of the high-voltage pistols is equipped with its own trigger. The test probes are only made accessible when both triggers are pulled and held simultaneously.
- **High-Voltage Pistol with Switch** (pistol with yellow marking)
  Includes double safety feature:
  The test probe is made accessible after the trigger at the high-voltage pistol with switch has been pulled to its initial mechanical limit stop. High-voltage is not switched to the test probe until the trigger is pulled beyond this position, assuming the instrument is in the “ready to activate” state.

General Safety Precautions

- **Integrated signal lamps** identify the operating status of the test instrument.
- Test voltage is **electrically isolated** from mains power. This prevents heavy current from flowing to ground via the high-voltage pistol with switch.
- **Current Limiting in the Event of Sparkover:**
  If the current limiting value entered as a parameter is exceeded in the event of sparkover, the instrument is automatically switched to the stand-by mode.
- The instrument is automatically switched to the stand-by mode **when power is restored after a mains failure**.

Attention!

The ventilation slots at the bottom of the high-voltage module and at the connector panel of the basic instrument must remain unobstructed!

Attention!
Observe regulations set forth in EN 50191, “Erection and operation of electrical test equipment”.

Attention!
If **safety test probes** are used, the operator must make certain that the probe tips and the connector cables are in flawless condition before beginning work.
All utilized equipment must be inspected for visibly apparent external damage and defects before use (see chapter 11.2, page 66, through chapter 11.4, page 67).

Attention!
It is imperative that the **measuring cables** are completely unwound prior to starting the high-voltage test.

Attention!
Make sure that all points of access to the danger zone have been secured **before testing is started**, and that no persons remain within the danger zone when the system is made **ready for activation**.

Danger: High-Voltage!
The test probe is made accessible after the trigger at the high-voltage pistol with switch has been pulled to its initial mechanical limit stop. High-voltage is not switched to the test probe until the trigger is pulled beyond this position, assuming the instrument is in the “ready to activate” state.

Danger: High-Voltage!
Touch **neither** the test probes **nor** the device under test during the voltage test!
A **life endangering high-voltage** of up to **5 kV** is present at the high-voltage module test probes!

Exclusion of Liability

In the event of a sparkover, PCs which are operated in proximity may crash, causing data loss in the process. Please therefore ensure, prior to conducting the high-voltage test, that all data and programs are saved appropriately and that the computer is switched off, if necessary. This phenomenon may even occur without an RS232 connection.

The manufacturer of the test instrument assumes no liability for any direct or indirect damage to computers, peripheral equipment or data stocks in connection with the execution of high-voltage tests.

Furthermore, the manufacturer assumes no liability for defects in DUTs caused by high-voltage tests. This applies especially for electronic components within devices.

Please also observe the checklist for high-voltage tests given in chapter 12.1.

3 Initial Start-Up

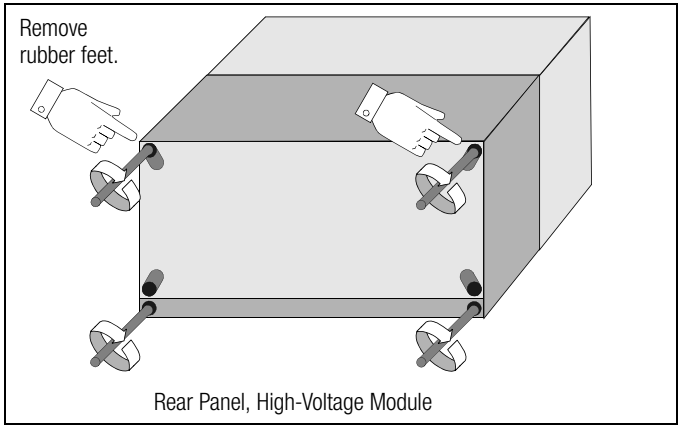
3.1 Start-Up of the Optional High-Voltage Module

3.1.1 Mounting the High-Voltage Module to the Basic Instrument

The HP or the HV high-voltage module must be mounted to the **PROFITEST 204+** test instrument before initial start-up.
When correctly mounted, reliable data exchange is assured between the two devices by means of LED transmission (see chapter 3.7.4, *"Performing the Self-Test"*).

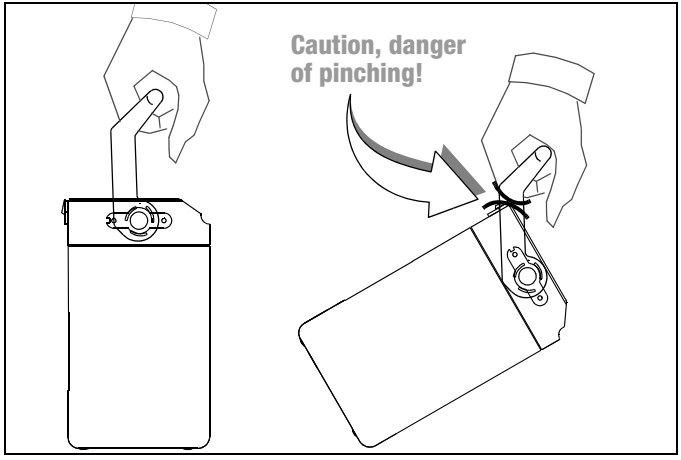
Attention!
The basic instrument and the high-voltage module must both be disconnected from the mains and from the measuring circuit prior to mounting.

- Close the lid of the basic instrument.
- Turn the basic instrument upside down. Place it onto a soft surface in order to avoid scratching the lid.
- Pull the two rubber feet from the bottom of the basic instrument behind which the through-holes are concealed.
- Position the high-voltage module such that the connector terminals and cables from both devices are on the same side.
- Pull the two rubber feet from the bottom of the high-voltage module behind which the through-holes are concealed.
- Set the four threaded rods into the through-holes (see sketch).
- Tighten the threaded rods with a screwdriver (4.5 mm).



Rear Panel, High-Voltage Module

- Insert the two previously removed rubber feet into the holes at the high-voltage module.



3.1.2 The Key Switch

The key switch protects the instrument against unauthorized use. Keep the key in a safe place to which only authorized personnel have access.
Each time testing is completed, turn the key to the “0” position and remove it from the lock.

3.1.3 Indication of Operating States

Signal Lamps

The signal lamps integrated into the high-voltage module indicate the two different operating states:

Green: **Stand-By State**

- Key switch is in the “I” position (on).
- Power supply to signal and control circuits at the high-voltage module is switched on.
- All test voltage circuits are switched off and are secured against inadvertent activation.

Attention!
All safety precautions which are required before entering the danger zone should now already be implemented, including posting of warning signs (WS1) and additional signs (ZS2) in accordance with DIN 40008, part 3.

Red: **Ready for Activation, Caution: Danger!**

- The menu used to start the voltage test has been opened and the start key has been activated.
- No voltage has yet been applied to the safety test probe, assuming the trigger at the high-voltage pistol has not been pulled.
- The test probes are secured against unintentional contact, assuming the triggers at the high-voltage pistols have not been pulled.

Attention!
When the instrument is “ready for activation”, all points of access to the danger zone must be secured!

See chapter 11.5.2, page 67, regarding signal lamp replacement.

External Signal Lamps

The external signal lamps indicate the same operating states as the signal lamps integrated into the high-voltage module. They are used for additional security at the measuring site, and must be plainly recognizable beyond the boundaries of the danger zone.

The external signal lamps can be directly connected to the respective terminals at the high-voltage module.

Note
For reasons of safety, only Z504D signal lamps by GMC-I Messtechnik GmbH may be used.

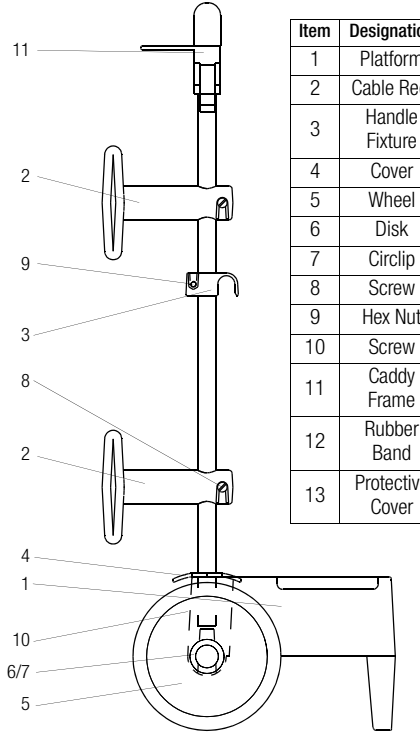
See chapter 11.5.3, page 68, regarding signal lamp replacement.

3.2 Mounting the Instruments to the Optional Caddy

- Place the unit (consisting of the basic unit and the high-voltage module) onto the caddy platform (1) such that the lid of the basic unit can still be opened.
- Secure the handle of the basic unit with the handle fixtures (3) on the vertical posts as follows:
- First loosen the screws at handle fixtures (9) with a 4 mm hex socket wrench.
- Push the handle fixtures (3) onto the handle and retighten the screws (9).
- Wind the two cables from the safety test probes at the high-voltage module onto the lower cable reel (2, bottom).
- Then wind the two cables from the test probes at the basic instrument onto the upper cable reel (2, top).
- Secure the cables and test probes with the included rubber bands (12).

Attention!
Observe regulations for portable testing systems as set forth in DIN VDE 0104 (3.6).

Note
Wind the cables from the safety test probes onto the reels included for this purpose at the back of the caddy after each use. The test cables may not, under any circumstances, be mechanically stressed or kinked, because this may result in impaired insulation characteristics. Remember that damage may not always be externally recognizable.

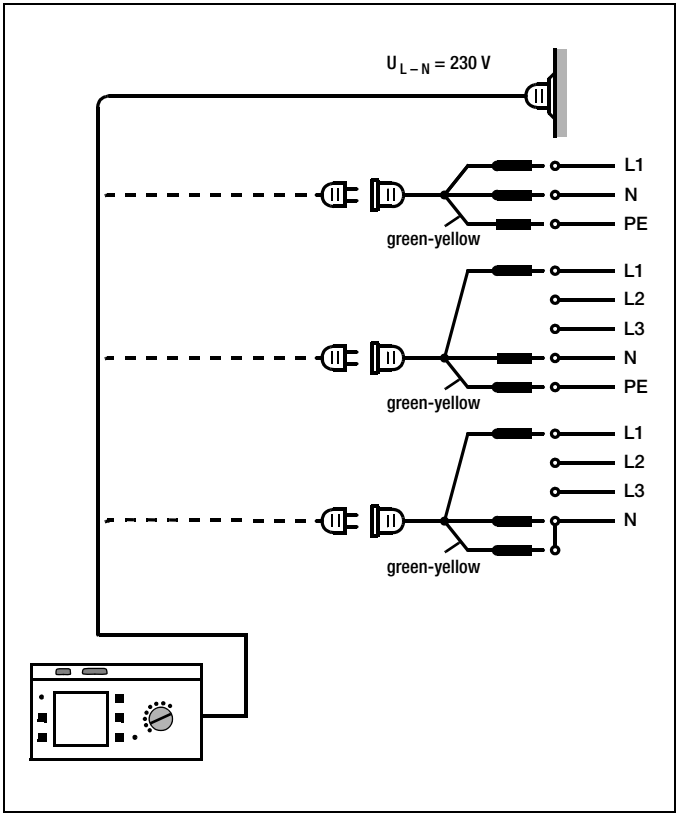


Item	Designation	Qty.	Order No.
1	Platform	1	3-117-193-01
2	Cable Reel	2	3-326-653-01
3	Handle Fixture	2	3-326-652-01
4	Cover	2	3-164-609-01
5	Wheel	2	3-419-038-01
6	Disk	4	3-740-013-01
7	Circlip	2	3-743-024-59
8	Screw	6	3-712-007-10
9	Hex Nut	6	3-730-119-12
10	Screw	2	3-716-018-24
11	Caddy Frame	1	3-121-111-01
12	Rubber Band	2	3-326-627-01
13	Protective Cover	1	3-171-302-01

Transport Caddy 204

Attention!
Always inspect the test cables for mechanical damage before starting up the high-voltage module, each time it is used.

3.3 Connecting the PROFITEST 204+ to 230 V Mains Power



➪ Connect the test instrument to 230 V mains power with the attached mains connection line (connection 22 at the instrument).
If an earthing contact outlet is unavailable, or if only a 3-phase outlet is available, the phase conductor, the neutral conductor and the protective conductor can be connected with the help of the socket adapter. The socket adapter is equipped with three permanently attached cables and is included as part of the KS13 cable set, which is available as an accessory.

Attention!
If a connection via earthing contact outlet is not possible, disconnect the mains from all sources of voltage before connecting the cables of the coupling socket via pick-up clips with the mains connections, as shown in the drawing.

Attention!
The recessed outlet at the basic instrument is used to supply power to the HP/HV high-voltage module.
If this outlet is used for any other purpose, current consumption may not exceed 6 A.

3.4 Connecting the High-Voltage Module to 230 V Mains Power

Connect the recessed outlet at the basic instrument to the inlet plug at the high-voltage module with the included power cable. The high-voltage module can also be connected directly to 230 V mains power.

3.5 Operating Software

Measuring and testing is quick and easy with the **PROFITEST 204+**. The integrated operating software informs the user concerning all necessary operating procedures, errors and measuring results etc., regardless of the selected measuring function. All information and measurement results are displayed at the dot matrix LCD in clear text.

The integrated operating software is sufficient for most tests and measurements. However, the operator should nevertheless read and observe the contents of these operating instructions.

3.6 Online Help

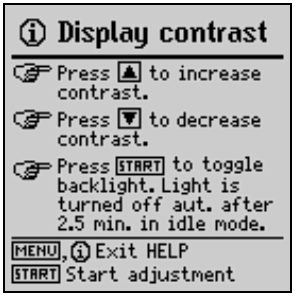
Online help can be queried and displayed at the LCD for all measuring and test functions, and for practically all settings.

Example: Display Contrast Function

Switch position

➪ Press the STORE key in order to query online help:

Query online help.


Display contrast
Press ▲ to increase contrast.
Press ▼ to decrease contrast.
Press START to toggle backlight. Light is turned off aut. after 2.5 min. in idle mode.
MENU, Exit HELP
START Start adjustment

➪ Press the same key once again, or the MENU key, in order to exit the online help function:

Exit online help.

or

➪ Start the selected function directly from the online help menu with the START key:

Start the selected function.

3.7 Setup

Various basic settings can be configured for the test instrument with the selector switch in the SETUP position.

Select the desired parameter.

Open parameters entry window.

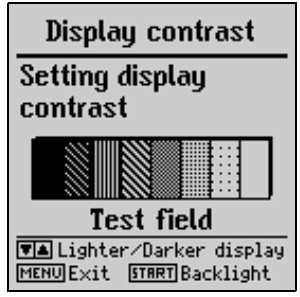
All settings and changes entered via the menus which are made available when the selector switch is in the SETUP position, are saved automatically and are retained, even after the test instrument has been disconnected from mains power.

Exit function.

3.7.1 Adjusting Contrast and LCD Illumination

Contrast can be increased or reduced with this function. Furthermore, illumination can be activated or deactivated. (Only for devices with electroluminescence lighting)

Adjust contrast.



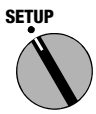
Activate or deactivate illumination. *

* This function is only available for devices with electroluminescence lighting. Background illumination is switched off automatically after 2.5 minutes, as long as no keys are activated during this period of time. Background illumination is reactivated for an additional 2.5 minutes each time a key is pressed.

3.7.2 Setting Time and Date

The test instrument's internal clock can be set with this function. The clock continues to run, even after the instrument has been disconnected from mains power. Time and date are included in the printed test reports.

The date is entered as follows: DD.MM.YYYY (**D**ay.**M**onth.**Y**ear).



Select time or date.

Select cursor position for data entry.

Change values.

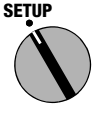
3.7.3 Configuring the Signal Generator

If "Measuring mode" or "On" is selected, various acoustic signal sequences are generated during operation of the high-voltage module which identify its operating state.

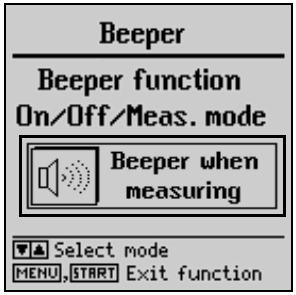
Measuring Mode: A "good" measurement is indicated with a single, long acoustic signal, and a "bad" measurement with three short acoustic signals.

On: Same as "Measuring mode", plus each key activation is acknowledged with an acoustic signal as well.

Off: No acoustic signals are generated.



Select On, Off or Measuring mode.

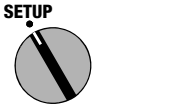


3.7.4 Performing the Self-Test

Display, lamp and relay functions, as well as options, are automatically tested and results are displayed.

Note

Before starting the self-test, both test probes must be disconnected from any devices under test, and must be kept separate from one another. It is also essential to assure that no voltage is present at the test probes.



Error Messages and their Meanings

Test results OK or option installed (high-voltage module)

Error message: Test failed, device under test defective or option not installed

ROM Checksum

A software error may have occurred. Install the included system software to the test instrument again. If problems persist, we recommend calling our product support hotline.

CAL Checksum

This portion of the self-test examines the calibration subassembly.

Even if the CAL checksum is OK, this does not mean that the **PROFITEST 204+** need not be calibrated in accordance with the prescribed schedule.
If this portion of the self-test is failed, the instrument must be returned to the manufacturer for re-calibration.

Temperature Inside the Test Instrument

The temperature limit has been intermittently exceeded inside the instrument. The measuring mode is disabled until the temperature drops back into the allowable range.
Do not start the next measurement until the temperature error has been cleared.

High-Voltage Module

An installed high-voltage module is recognized automatically. Proceed as follows if an error message is read out for this portion of the self-test, even though a high-voltage module has been connected:

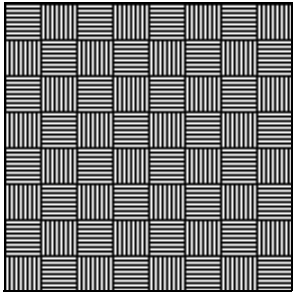
Check the connections at both instruments and, above all, make sure that the signal tubes at the high-voltage module have not been obstructed or covered.

LCD Test

In the following two tests, neighboring horizontal and vertical elements at the LCD are activated separately. If individual cells do not become active, send the instrument to an authorized service center for repair.

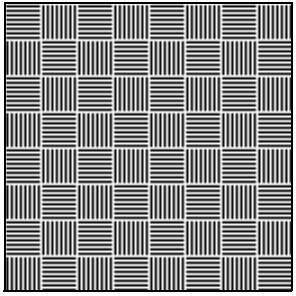
START

Continue testing.



START

Continue testing.



START

Continue testing.

Note

The LEDs must first blink, and the relays must be switched before they can be checked off as OK.

3.7.5 Uploading the Desired Language or a Software Update

If a language other than the one included with the instrument is desired, it can be uploaded with the help of the WinProfi* PC program. The file with the desired language is transmitted to the test instrument via the serial interface. The previously installed language is overwritten in the process.
Software updates can also be uploaded with the same program, independent of the currently installed language.

Note

WinProfi software can be used to upload the desired language to the test instrument. The software encompasses all of the functions required for establishing communications between the **PROFITEST 204+** and a PC. A program description is contained in the online instructions included with the WinProfi software.

WinProfi software

* *WinProfi is currently applicable up to Windows 7 (32 Bit)

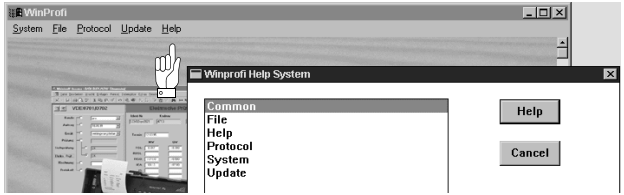
A Installing and Starting WinProfi Software at the PC

- Download the WinProfi software from our homepage: http://www.gossenmetrawatt.com (→ Products → Software → Software for Testers → WinProfi)
- Unzip the zip file „winprofi.zip“.
- Install the software on your PC by executing file Setup_WinProfi_Vx.xx.exe.
- Select the desired language for the WinProfi software and for the user interface of the test instrument.
- Follow the instructions which appear at the monitor.

The program is added to your start menu after installation.

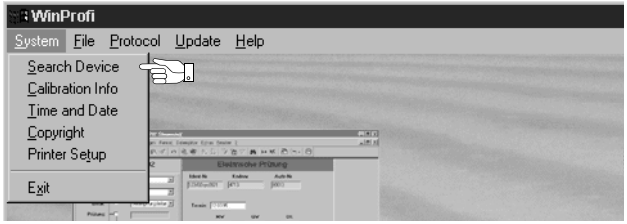
- Establish a connection between the PC and the **PROFITEST 204+**. Use an appropriate interface cable to this end, see page 5.
- Start WinProfi again.
- Switch the test instrument on.

Display or print out online user's manual.
The online manual contains information concerning the software which is not included in these operating instructions.



B Prerequisites for Software-Update or Exchange of Data

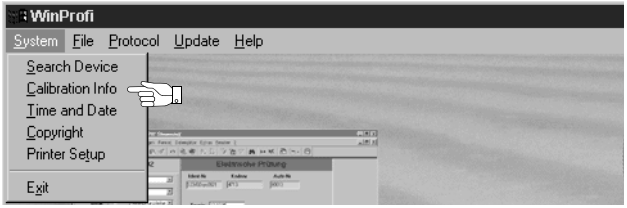
➪ Find the interface to which the **PROFITEST 204+** is connected.



Note

Always start this function first, **before performing an update or changing report templates.**
After starting this function, WinProfi loads the report files specifically necessary for the connected instrument.
Due to the fact that WinProfi has been created for use with several types of test instruments, incorrect test reports may otherwise be loaded, or erroneous options may be made available.

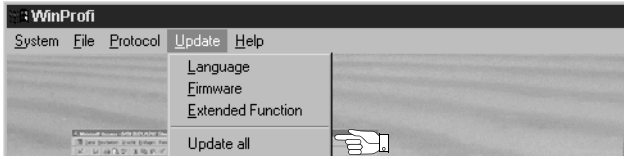
➪ Query information regarding current software version.



C Transmitting a Software Update to the Test Instrument

Attention!

Previously saved data are lost during the updating procedure. Save the measured values to your PC before.



➪ *PC:* Select **Update all** from the **Update** menu. Follow the instructions which appear at the monitor.

Depending upon the utilized PC, updating takes from 1 to 2 minutes.

The green LED indicates that the instrument is ready to receive data. If the PC and the test instrument are correctly synchronized, the yellow LED lights up and the green LED goes out. The red LED lights up during programming sequences. After transmission has been completed, the LED goes out and the instrument is restarted.

The message "Transmission done" appears at the PC.

Attention!

The instrument may not, under any circumstances, be switched off during transmission, nor may the connection to the PC be interrupted!

- Subsequently select „Language" (loading the respective language), if applicable.

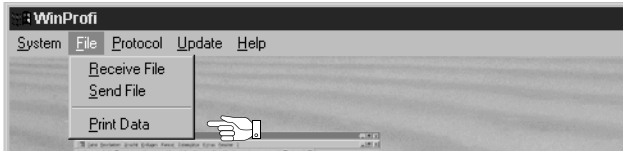
D Organizing Report Data

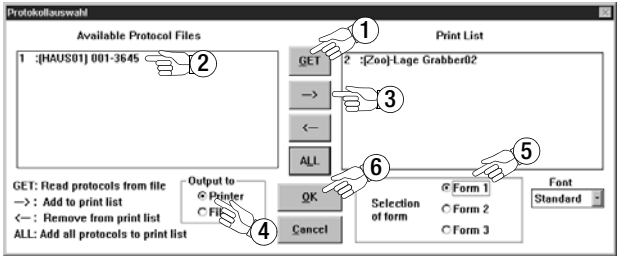
⇨ Connect the test instrument directly with the PC via an appropriate interface cable.

Note
Do not connect the PC to the SI module.

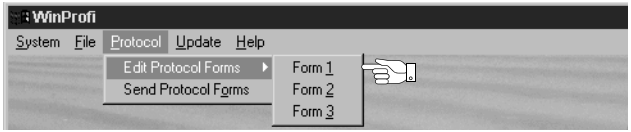
- Send or receive a data file

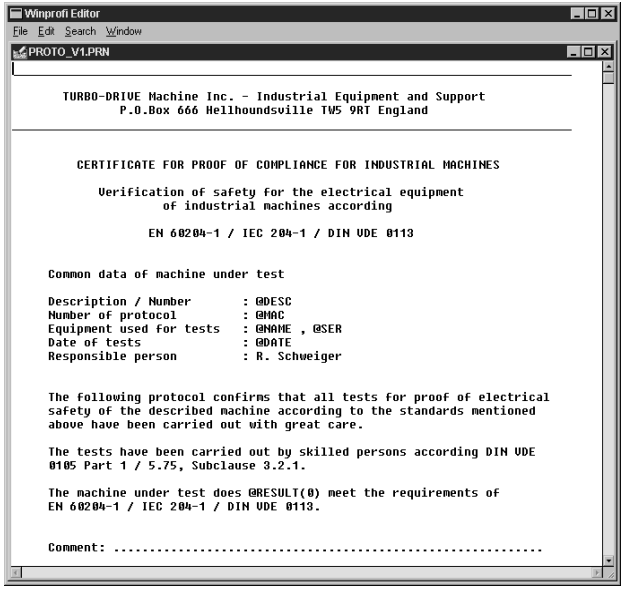
- Print data





- Edit or transmit report templates




Winprofi Editor
File Edit Search Window
PROTO_V1.PRN
TURBO-DRIVE Machine Inc. - Industrial Equipment and Support
P.O.Box 666 Hellhoundsville TW5 9RT England
CERTIFICATE FOR PROOF OF COMPLIANCE FOR INDUSTRIAL MACHINES
Verification of safety for the electrical equipment
of industrial machines according
EN 60204-1 / IEC 204-1 / DIN VDE 0113
Common data of machine under test
Description / Number : @DESC
Number of protocol : @MAC
Equipment used for tests : @NAME , @SER
Date of tests : @DATE
Responsible person : R. Schweiger
The following protocol confirms that all tests for proof of electrical safety of the described machine according to the standards mentioned above have been carried out with great care.
The tests have been carried out by skilled persons according DIN VDE 0105 Part 1 / 5.75, Subclause 3.2.1.
The machine under test does @RESULT(0) meet the requirements of EN 60204-1 / IEC 204-1 / DIN VDE 0113.
Comment: .....

4 Testing Machines in Accordance with DIN VDE 0113 and EN 60 204

Each of the following tests is automatically allocated to the currently selected system number. If the respective test results are saved with the STORE key, they are assigned to this number. The system number can be entered in the “Select system” menu (see chapter 5.1, page 42).

The following sequence applies to the measuring mode:

- Select the desired test.
- Enter test parameters (if required).
- Start measurement or return to the initial menu.
- Save measured values to memory and enter a description (if desired)

The protective conductor test, the insulation test and saving measured values to memory can be triggered from the test probe (17).

Test Parameters and Limit Values per DIN VDE

Note
If test parameters and limit values have been changed, we recommend resetting these to the default settings in accordance with DIN VDE before testing a new system.

Switch the test instrument on to this end. Press the MENU key and then turn the function selector switch to the TEST position. This restores default values in accordance with DIN VDE. Standard values in accordance with DIN VDE are included in the table in chapter 8, page 57.

Setting Ranges for PROFITEST 204+ Parameters

The lower and upper limit values for all adjustable parameters are included in the table in chapter 8, page 57.

4.1 Protective Conductor Test

Uninterrupted connection of a protective conductor system is tested here by using an alternating current of approximately 10 A with a line frequency of 50 Hz. Testing must be conducted between the PE terminal and various points within the protective conductor system.

If resistance values of less than 1.00 Ω occur, **voltage drop ΔU for respective protective conductor resistance** is displayed. This is the calculated voltage value based upon a 10 A test current in accordance with DIN VDE 0113.
Voltage at the test probes is displayed for resistance values of 1.00 Ω to 25.0 Ω, and for over-ranging (> 25.0 Ω), because calculated voltage drop ΔU based upon 10 A would lead to unrealistically high results in this case.

After expiration of the test duration, the highest measured protective conductor resistance value and the corresponding voltage drop value are displayed.

Always assure that adequately good contact has been established with the device under test before starting the test. The test can be started with the key (20) on the test probe (17) if preferred.

If test current drops to a value of less than 10 A during the selected test duration, a corresponding message appears at the display. However, testing is continued normally. In the event of poor contact or if the test probes are not connected, testing is aborted.

If voltage is present at the test probes after measurement has begun*, no measurement is performed. **Interference voltage at test probes** appears at the display, and a **STOP signal** is displayed simultaneously.

* this message may be displayed in the case of interrupted protective conductor connections as well, as external voltages have been included capacitively here.

Select the desired test.

Open the parameters entry window.

4.1.1 Configuring Test Parameters

Test duration can be adapted to local circumstances.
Recommended test duration: 10 s.
The **limit value** for protective conductor resistance can be changed depending upon conductor cross-section and the characteristics of the overvoltage protection device which is used with the machine.

Select the parameter.

Set the value.

The limit value setting for protective conductor resistance is based upon the cross-section of phase conductor L and, if applicable, neutral conductor N, and not the cross section of protective conductor PE. This is necessary because cables with phase conductor cross-sections of greater than 16 square mm are equipped with protective conductors of reduced cross-section, and selection on the basis of protective conductor cross-section would not be unequivocal.

A rated current (nominal current) is assigned to the phase conductor cross-section for the respectively utilized overcurrent protection device, as shown in the following table. The table can be displayed from the TEST menu in order to simplify selection as an aide to the protective conductor test function.

Query help.

Prot. conductor

Limit value for PE test based on conductor cross-section and nom. current of the protective device	Ø L[N]	Ø PE	IN
	1.5mm²	1.5mm²	16A
	2.5mm²	2.5mm²	20A
	4.0mm²	4.0mm²	25A
	6.0mm²	6.0mm²	32A
	10mm²	10mm²	50A
	16mm²	16mm²	63A
	25mm²	16mm²	80A
	35mm²	16mm²	100A
	50mm²	25mm²	125A
	70mm²	35mm²	160A
	95mm²	50mm²	200A
	120mm²	70mm²	250A

Due to the fact that according to EN60204-1:2006 overcurrent protection devices with varying tripping characteristics are permissible for each phase conductor cross-section, 5 different types are offered for cross-sections of up to 16 square mm, and two for cross-sections of greater than 16 mm when selecting the limit value.

MENU

Select the parameter.

Set the value.

Proceed as follows in order to select the limit value:

- Ascertain the phase conductor cross-section of your connector cable.
- If applicable, check to see whether or not the nominal current of the utilized overcurrent protection device is allocated to the phase conductor cross-section. If an overcurrent protection device with low nominal current is used, you can determine the limit value on the basis of the phase conductor current assigned to this nominal current.
- Select the limit value on the basis of the triggering characteristics offered for the various overcurrent protection devices.

If your machine/system includes components with different power cable cross-sections (e.g. fans, pumps etc.), and if these are equipped with their own overcurrent protection devices, the limit value for the protective conductor test must be selected in accordance with the power cable cross-section of these components, or with the overcurrent protection devices which have been installed for them.

Attention!

It is imperative that the **measuring cables** are completely unwound prior to starting the protective conductor test.

4.1.2 Start the Test

START

or

Note

The test can only be started with the START key on the test instrument from the test parameters window (see picture on page 27).

STORE

Press briefly: Store an event.
Press and hold: Store an event and activate the entry field. Up to 15 characters can be entered to the entry field, or to the info field at the bottom left as a description for the measurement. See chapter 5.1.1 regarding data entry.

or

Press briefly: Save results.
The green/red signal lamp is extinguished briefly as acknowledgement.

4.2 Insulation Resistance Test

In accordance with EN 60204/DIN VDE 0113, insulation resistance measured between the phases of all current circuits and the protective conductor circuit with 500 V direct voltage may not be less than 1 MΩ.

Four nominal voltage ranges are included with the **PROFITEST 204+** for this test: 100 V, 250 V, 500 V and 1000 V. These can be configured as test parameters, as is also the case with the allowable limit value for insulation resistance.

The measurement can be started in an ideal fashion with the key (21) on the test probe (17). For capacitive devices under test, or for DUTs with relatively long cables, press and hold the key (21 or 10) until stabilized display values have been obtained. When the START key is pressed and held, the instrument performs continuous, instead of an individual measurement.

Voltage at the device under test appears at the LCD in addition to measured insulation resistance.

Attention!

Do **not** touch the test probes during this measurement! A direct voltage of up to 1000 V is present between the test probes.

Note

Testing of measurement cables

The first test should be conducted on test probes with short-circuited measurement cables. The instrument must indicate a value of approximately zero Ω. This serves to establish whether the measurement cables are disconnected at any point.

Discharge

Upon completion of the measurement, the device under test is automatically discharged in order to assure absence of voltage. The falling voltage value can be observed at the display during discharging. The measured insulation resistance value remains in memory during this period of time.

Interference voltage

If voltage is present at the test probes after measurement has begun, no measurement is performed. **Interference voltage at test probes** appears at the display, and a **STOP signal** is displayed simultaneously.

Select the desired test.

Open the sub-menu.

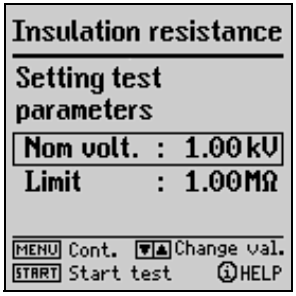
4.2.1 Configuring Test Parameters

Select a test voltage of 500 V for the main circuit, or 1000 V if required for extended testing. A lower test voltage can also be selected for testing voltage sensitive components. The allowable **limit value** for insulation resistance can also be changed.

MENU

Select the desired parameter.

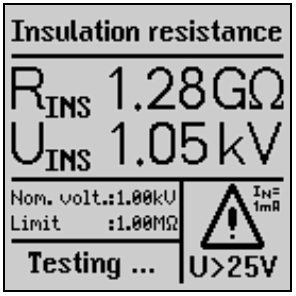
Adjust to the desired value.



4.2.2 Start the Test

START

or



Note

The test can only be started with the START key on the test instrument from the test parameters window.

STORE

Press briefly: Store an event.
Press and hold: Store an event and activate the entry field. Up to 15 characters can be entered to the entry field, or to the info field at the bottom left as a description for the measurement. See chapter 5.1.1 regarding data entry.

or

Press briefly: Store an event.
The green/red signal lamp is extinguished briefly as acknowledgement.

4.3 Leakage Current Test

This test is required by DIN VDE 0701-0702. It can be used to test devices, machines and systems for the observance of limit values for leakage current (contact current).

Leakage current and voltage drop resulting from this current at a 2 kΩ load are measured and displayed.

Note
If a voltage of greater than 20 V occurs at the test probes, leakage current measurement is stopped. The 2 kΩ load is also deactivated in this case.
Display of measured voltage ΔU nevertheless continues.

Attention!
Interference voltage may not exceed 250 V.

Select the desired test.

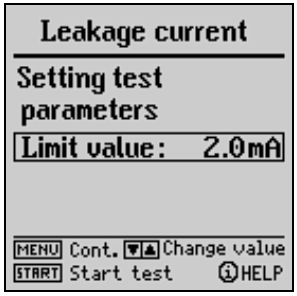
Open the sub-menu.

4.3.1 Configuring Test Parameters

The **limit value** (maximum leakage current) can be changed.

Select the desired parameter.

Adjust to the desired value.



4.3.2 Start the Test

Note
The leakage current test can only be started with the START key on the test instrument.

Press briefly: Store an event.
Press and hold: Store an event and activate the entry field.
Up to 15 characters can be entered to the entry field, or to the info field at the bottom left as a description for the measurement.
See chapter 5.1.1 regarding data entry.

or

Press briefly: Store an event.
The green/red signal lamp is extinguished briefly as acknowledgement.

4.4 Voltage Measurement (protection against residual voltage)

EN 60204 requires that voltages in excess of 60 V occurring at all accessible machine components during operation must drop to a residual voltage value of 60 V or less within a period of 5 seconds after supply power has been switched off.

Testing for the absence of voltage is conducted with the **PROFITEST 204+** by means of a voltage measurement which measures discharge time as well. During discharge, elapsed time is continuously displayed at the LCD after supply power has been switched off, until the limit value of 60 V has been reached.

In addition to the type of voltage (AC, DC or AC+DC), the respective frequency is measured and displayed as well. The mean value is always read out.

In addition to voltage and frequency, type of voltage (AC, DC or AC+DC) is displayed in the symbol field at the bottom right-hand portion of the display.

If, during a voltage measurement with a measured value of more than 60 V, the voltage value drops by more than 5% of the measured value during one measuring period (approx. 0,7 s), time measurement for the testing of protection against residual voltage is started automatically. Elapsed time can be observed in the symbol field at the display. Time measurement is stopped as soon as the measured value drops to below the 60 V threshold. Elapsed time required for discharge to 60 V now appears at the display. Voltage measurement continues until maximum allowable discharge time has elapsed (normally 5 s). The measured voltage value is then frozen and the DATA HOLD symbol appears at the display. If the 60 V limit is not reached within the allowable discharge period, the voltage value measured at the end of this period is frozen and time measurement continues until 10 seconds have elapsed. If the voltage value is still above 60 V, the test is aborted and the instrument resumes voltage measurement.

If a value has been frozen at the display, voltage measurement is not resumed by the instrument until:

- The START key is pressed
- The measurement is stored to memory with the i/STORE key
- Voltage measurement is restarted from the menu
- Voltage at the test probes climbs again to a value of greater than 60 V, or, assuming the last measured voltage value was greater than 60 V, the following measured value is even higher, i.e. if rising voltage can be observed.

Elapsed time and the measured voltage value at the end of the allowable discharge period are stored to memory by activating the i/STORE key. If discharge does not occur, only the voltage value is saved.

Note

If conductors are exposed when a machine is switched off which are not protected against direct contact (e.g. if plug connections are interrupted), the maximum allowable discharge period is 1 second!

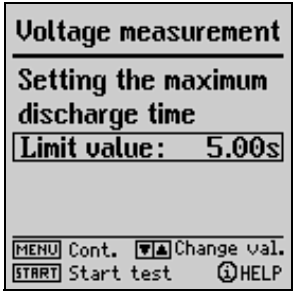
Select the desired test.

Open the sub-menu.

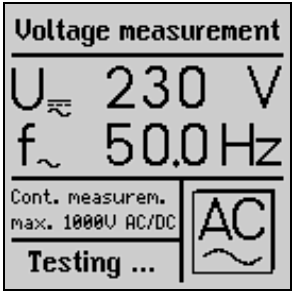
4.4.1 Configuring Test Parameters

The **discharge period** (the time during which the voltage value must be reduced to a safe level of less than 60 V) can be set within a range of 0 to 9 seconds. “Residual voltage less than 60 V!” is displayed when this threshold has been reached.

Set discharge period duration.



4.4.2 Start the Test



Note

The voltage test can only be started with the START key on the test instrument.

Press briefly: Store an event.
Press and hold: Store an event and activate the entry field. Up to 15 characters can be entered to the entry field, or to the info field at the bottom left as a description for the measurement. See chapter 5.1.1 regarding data entry.

or

Press briefly: Save results.
The green/red signal lamp is extinguished briefly as acknowledgement.

4.5 Voltage Test (option: PROFITEST 204HP/HV)

Electrical equipment at machinery must withstand a test voltage applied between the conductors of all electrical circuits and the protective conductor circuit for a period of at least 1 second, with a value of twice the rated voltage of the equipment or 1000 V~, whichever is greater. The test voltage must have a frequency of 50 Hz and must be generated by a transformer with a minimum power rating of 500 VA.

Note

The **PROFITEST 204+** must be used in combination with the PROFITEST 204HP/HP-2.5kV high-voltage module for testing in accordance with DIN VDE 0113.
The PROFITEST 204HV/HV-5.4kV is required for testing with up to 5 kV.

*The **PROFITEST 204+** automatically recognizes which type of high-voltage module has been connected. Communication between the basic instrument and the high-voltage module can be tested as described in chapter 3.7.4.*

Attention!

Inspect the test instrument, high voltage cables and high-voltage pistols to assure flawless condition before beginning work (see also chapter 11.4, page 67).

Note

Testing of measurement cables

The first test should be conducted on test probes with short-circuited measurement cables. The instrument must indicate a value of approximately zero Ω. This serves to establish whether the measurement cables are disconnected at any point.

4.5.1 Functions Test (test preparation)

Perform the following functions test in the indicated order from a) through e).

a) Key Switch

⇨ Set the key switch to “0”.

• Neither the green nor the red signal lamps may light up.

b) Voltage Test

⇨ Set the key switch to “I”.

• The green signal lamps must light up.

⇨ Select the voltage test with the ▲ ▼ keys.

Select the desired test.

Initialisation of high-voltage module as a prerequisite for correct parameter input

⇨ Press the START key.

The corresponding high-voltage module is recognized and displayed in the bottom left corner of the LCD provided it has been correctly connected and the key switch is in the „I“ position. The initialisation ensures that the parameter values that are subsequently entered are within the limits applicable to the respective high-voltage module.

⇨ Select the desired values for test duration, test voltage, breaking current I_{MAX} and rise time (chapter 4.5.2, page 37).

Note
Do not set I_{MAX} to pulse control!

⇨ Press the START key.

- The red signal lamps must light up.
- The following values are displayed at the LCD:
  U_T = – – – V
  I_T = – – – mA

  The following symbol appears:

Danger: High-Voltage!
Touch **neither** the test probes **nor** the device under test during the voltage test!
A life endangering high-voltage of up to **5 kV** is present at the high-voltage module test probes!

⇨ Pull the trigger at the marked high-voltage pistol with switch to its limit stop and hold depressed.

- The following values are displayed at the LCD:
  U_T = selected value
  I_T = 00.0 mA or 0.00 mA

  The following symbol appears:

⇨ Release the trigger (switch).

- Voltage is switched off automatically after the selected test duration has elapsed.

c) Shutdown Functions

⇨ Short circuit the two high-voltage pistols.

⇨ Pull the trigger at the marked high-voltage pistol with switch to its limit stop and hold depressed.

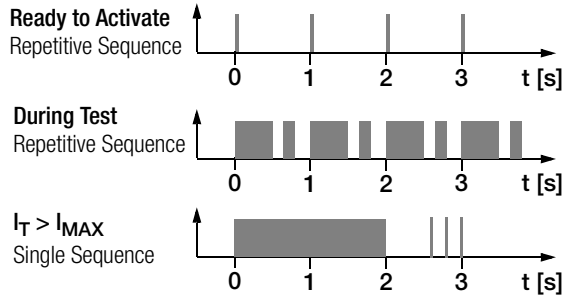
- The instrument is shut down immediately.
- The green signal lamps must light up, and the red signal lamps may not light up.
- The following values are displayed at the LCD:
  U_T = XXX V
  I_T = > XXX mA
  The last measured voltage value before breaking current was exceeded is displayed along with breaking current I_{MAX}.

  The following symbol appears:

d) Signal Lamps

Two lamps are arranged diagonally at the test instrument and are used to signal operating states. If both lamps go out when the instrument is in the “ready to activate” operating state (RED), test voltage is no longer generated.
Do not start the voltage test unless all signal lamps indicate correct functioning.
Defective lamps must be replaced as described in chapter 11.5.2, page 67.

Acoustic Signals (signals for “On” or “Measuring mode”)



See chapter 3.7.3, page 20 regarding activation of this function.

4.5.2 Configuring Test Parameters

The following parameters can be configured with the green signal lamps illuminated in the stand-by state:

Test Duration: Time period during which test voltage is applied.
Setting range: 1.00 to 120 s, the continuous operation symbol >>>>>>> can be selected with the ▼ key by scrolling to below 1.00 s

Test Voltage: Test voltage level
Setting range:

HP:	250 V ..... 2.00 kV
HP-2.5kV:	250 V ..... 2.50 kV
HV:	650 V ..... 5.00 kV
HV-5.4kV:	650 V ..... 5.35 kV

I_{MAX}: Maximum allowable current before high-voltage is switched off
Setting range:

HP:	10.0.....250 mA
HP-2.5kV:	10.0.....200 mA
HV:	0.50....10.0 mA
HV-5.4kV:	0.50....10.0 mA

Control symbol >>>>>>> can be selected with the ▼ key by scrolling to below 10.0 or 0.5 mA

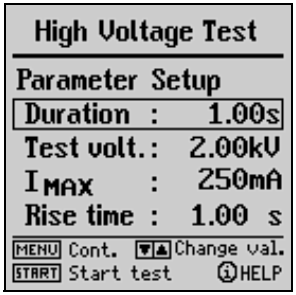
Rise Time: Period of time during which test voltage rises to the selected value.
Setting range: 100 ms to 99.9 s

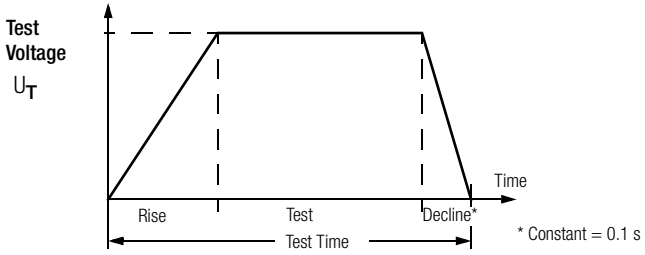
At table showing all setting ranges and standard values is included in chapter 8, page 57.

MENU

Select the desired parameter.

Adjust to the desired value.





4.5.3 Test Sequence

Attention!

Make sure **before testing is started**
- that the measuring cables are completely unwound,
- that all points of access to the danger zone have been secured and that no persons remain within the danger zone when the system is made **ready for activation**.

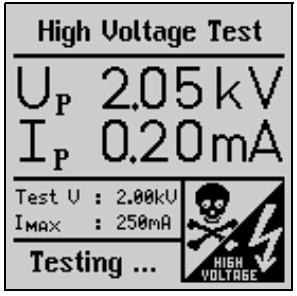
➪ Turn the key switch to the “I” position.

The test instrument is switch to the stand-by mode.
The green signal lamps are illuminated.

➪ Check the test parameters.

➪ Press the START key.

The instrument is switched from stand-by to the “ready for activation”. **The red signal lamps are illuminated.**



Danger: High-Voltage!

Touch **neither** the test probes **nor** the device under test during the voltage test!
A **life endangering high-voltage** of up to **5 kV** is present at the high-voltage module test probes!

➪ Position the high-voltage pistol in proximity to the device under test.

➪ Pull both triggers, but only pull the trigger at the high-voltage pistol with switch to its initial limit stop.

The test probes are exposed.

➪ Establish contact with the test circuit.

➪ Pull the trigger at the high-voltage pistol with switch to its final limit stop.

High voltage is now switched to the test probes.
Testing continues until the selected rise time and the test duration have elapsed.

An acoustic signal is generated by an internal buzzer for the duration of the test (application of high voltage including rise and decline).

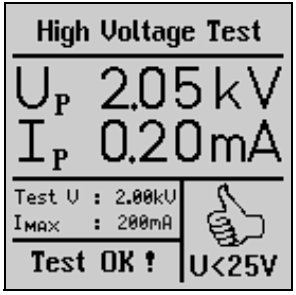
➪ For subsequent testing of neighboring circuits, release the trigger until it reaches its initial limit stop, establish contact with the next test circuit and pull the trigger to its final limit stop. Testing is started again.

Storing Measured Values to Memory

After the test sequence has been completed, the last measured values for U_T and I_T remain at the display. These results can be saved with or without a comment, and a consecutive number is assigned to the test automatically.
Up to 15 characters can be entered to the entry field, or to the info field at the bottom left as a description for the measurement. See chapter 5.1.1, page 43, regarding data entry.

The values at the display are overwritten when the next test is executed.

Press briefly: Save results.
Press and hold: Store an event and activate the entry field.



No values are saved to memory for U_T and I_T during continuous operation (with test duration set to >>>>>>>).

Premature Interruption of the Test

The test can be interrupted prematurely at any time by releasing the trigger at the high-voltage pistol with switch.

If testing is interrupted by releasing the trigger at the high-voltage pistol before the pre-selected test duration has elapsed, the values displayed for U_T and I_T may deviate from the last measured values.

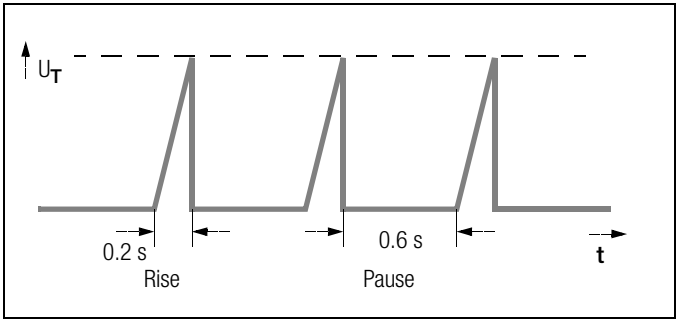
Note

Regarding Breakdown Voltage:
If the selected breaking current I_{MAX} is exceeded before the selected test voltage value has been reached, the test voltage measured at this point in time is preceded with the “>” symbol at the display, and is stored to memory. The corresponding symbol appears as well.

4.5.4 Pulse Control Mode

The pulse control mode is recommended for troubleshooting (locating the point of flashover).

Breaking current I_{MAX} is set to a fixed value of approximately 125 mA for the 204HP and 5 mA for the 204HV in the pulse control mode. If this value is exceeded, test voltage is switched off within 0.5 ms. After approximately 0.6 s, test voltage is increased from 0 to the selected maximum value within a period of 0.2 s, or is switched off again if breaking current is exceeded.



- Set I_{MAX} to >>>>>>> for selection of the pulse control mode (see chapter 4.5.2, page 37).
- If **continuous operation** is required, set test duration to >>>>>>> as well (see chapter 4.5.2, page 37).

4.5.5 Ending the Voltage Test

- Release the triggers at the high-voltage pistols.
- Press the MENU key.
- The signal lamps switch from red to green.
- If the test system is left unattended, it must be switched to the “out of service” mode (signal lamps off).
- Turn the key switch to the “0” positions and remove the key. Secure the instrument against unauthorized use.

5 Processing, Transmitting and Deleting Data

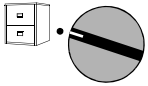
Previously stored data or data records can be processed with the function selector switch in the **data management** position.
The following functions are available:

- **Select a System**
  A system number can be selected with this function to which measurement results can then be stored. A description of the system can be entered as well.
- **Data Processing**
  Individual data from a previous measurement (e.g. protective conductor test) can be displayed for the selected system and can be deleted if desired.
- **Data Reorganization**
  Previously added systems can be deleted from memory, and a memory test can be performed.
- **Clear Memory**
  This command deletes data records which have been saved for all existing systems. Full memory capacity is made available in this way.
- **Data Transmission**
  Measurement data (the entire contents of the memory at the **PROFITEST 204+**) can be transmitted to a PC with this function, where they can be subsequently analyzed, e.g. with the programs WinProfi, PS3 or EXCEL. Data records which have been saved to the PC can be transmitted back to the test instrument.

Memory Capacity

Current memory capacity is continuously displayed as a bar graph in the first three functions listed above.
Depending upon how many systems have been entered (max. 254), up to 2800 measurements can be stored to memory.

5.1 Selecting a System

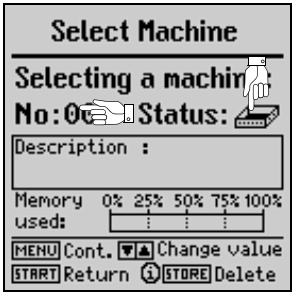


Select the desired command.

Sub-menu

System No.

Select a number.



Status: A filled in file cabinet indicates that measurement data have already been stored for the selected system.

5.1.1 Entering a Description

MENU

Description

Description:

Descriptions can be entered for the various systems. The description is displayed and subsequently printed out when the respective system is selected.

Note: An ID number should be entered for each system if PS3 software is used. Enter the number in parentheses. The system description appears to the right of the ID number (see illustration above). Parentheses are entered by pressing and holding the shift key, and simultaneously pressing the number keys 8 and 9.

Descriptions can be entered in two different ways:

- **Convenient Entry with the SI Module (optional)**
  Descriptions can be entered with the alphanumeric keypad at the SI module (see operating instructions included with the **SECUTEST SI+**).
- **Entry with the Keys at the PROFITEST 204+**

Select letters, numbers or characters.

STORE

Move the entry cursor left.

START

Move the entry cursor right.

MENU

Entered data must be acknowledged with the MENU key. The previously entered data are then saved to memory. Alternatively, data can be saved by pressing the STORE key at the SI module.

Up to 250 characters can be entered. The entry field scrolls automatically from one line of text to the next. Apart from the SI module, data can also be entered via the PC keyboard (requires adapter PROFI-MF-II, article number Z504H).

A comment can be entered for each test procedure in the same way, immediately after completion of the test. However, the length of these comments is limited to 15 characters.

5.1.2 Copying Descriptions

- Select the system with the description to be copied, and press the MENU key three times.
- Select the new system and press the MENU key.

The copied text appears and can be edited as desired.

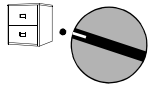
5.1.3 Deleting a Description

- Simultaneously press the i/STORE and the START keys.

The description is deleted and the cursor jumps to the first entry position in the respective description entry field.

5.2 Data Processing (viewing measured values)

Measured values can be viewed, and individual measurements can be deleted if desired.



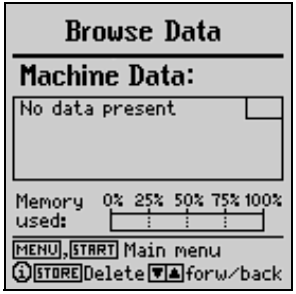
Select the desired command.

Select the desired measurement.

Delete the measurement.

“Data record deleted” appears at the display after deletion of the selected measurement has been started.

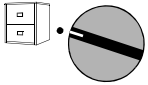
The i/STORE key must be pressed and held for approximately 1 second in order to delete a data record, thus preventing inadvertent deletion of data. If the key is not released after deletion of the selected data record, all following data records are deleted sequentially at a rate of 1 record per second.



5.3 Data Reorganization

5.3.1 Deleting Recorded Data

Data from individual systems which have already been printed out, and existing systems which contain no data, can be deleted with this function.



Select the desired command.

Sub-menu

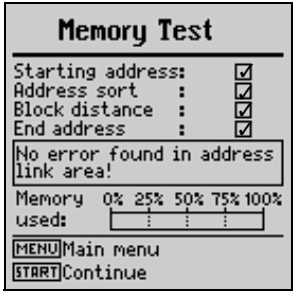
Delete data.

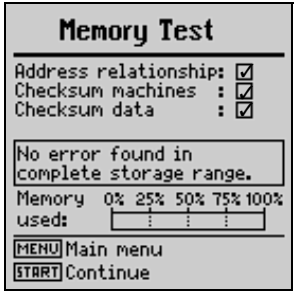
A security query must be acknowledged before individual system data are deleted. A message appears after data has been deleted from all systems for which reports have been printed. After pressing the START key again, a list is read out which includes all systems whose stored data have not yet been printed out.

5.3.2 Memory Test

Memory is tested for errors with this function. Errors can be corrected in some cases. Follow the instructions which appear at the display.

Test the memory.



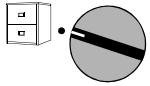


5.4 Clearing Memory

This command deletes stored data from all existing systems. Full memory capacity is made available in this way.

Attention!

Transmit and save all data to a PC before clearing the memory!



Select the desired command.

Sub-menu

Execute the command.

Delete data
The complete data storage will be deleted.
All saved machine data and measurements will be lost!
MENU Main menu
HELP
START Delete data storage

A security query must be acknowledged before all data records are deleted. Permanent deletion is executed with the i/STORE key.

5.5 Data Transmission

Measurement data (the entire contents of the memory at the **PROFITEST 204+**) can be transmitted to a PC with the function selector switch in the **data management** position, where it can be subsequently analyzed. Measurement data can also be transmitted back to the test instrument.

Note

WinProfi software, which is included with the **PROFITEST 204+**, can be used for the transmission of data from the test instrument to the PC, and vice versa. This software encompasses all functions required for communications between the **PROFITEST 204+** and the PC. A program description can queried from the online handbook included with the WinProfi program.

A Installing and Starting WinProfi at the PC

- Install the program as described in chapter 3.7.5, part A, if not already installed.
- Start WinProfi from the Windows start menu.

B Data Transmission Prerequisites

- Establish a connection between the PC and the test instrument. Use the Z3241 cable to this end.
- Switch on both devices.

C Transmitting Data from the Test Instrument to the PC

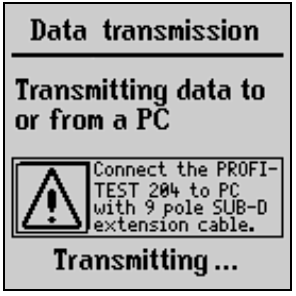
- *PC:* Select **Receive data** in the **File** menu.
  Follow the instructions which appear at the monitor.
- *PC:* Select the directory to which the file is to be transmitted.
- *PC:* Enter a file name. The data file extension .DAT is added automatically.
- *PC:* Start transmission by clicking the OK button.

Three files are generated which can only be differentiated by means of their data formats and the corresponding data file extensions:

NAME.DAT: Machine-readable data file
NAME.TAB: Data file in ASCII format
NAME.XLK: EXCEL data file

Note

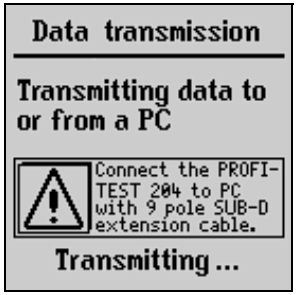
Transmitting measurement data back to the test instrument is only possible with the DAT file.


Data transmission
Transmitting data to or from a PC
Connect the PROFI-TEST 204 to PC with 9 pole SUB-D extension cable.
Transmitting ...

D Transmitting Data from the PC to the Test Instrument

- *PC:* Select **Transmit data** in the **File** menu.
  Follow the instructions which appear at the monitor.
- *PC:* Enter the name of the file whose data are to be transmitted to the test instrument: NAME.DAT
- *PC:* Start transmission by clicking the OK button.

Note
In order to transmit data from the PC to the test instrument, the data file to be transmitted must be in the same directory as the WinProfi program files.


Data transmission
Transmitting data to or from a PC
Connect the PROFI-TEST 204 to PC with 9 pole SUB-D extension cable.
Transmitting ...

6 Printing, Uploading and Creating Reports

The test instrument's report functions can be activated by setting the function selector switch to the **Printer** position. The following functions are available:

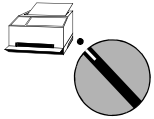
- **Print Values (PSI) (only in conjunction with SECUTEST PSI):**
  Measured values from a selected system can be read out via the serial interface and printed out at the PSI module (optional)

- **Print Reports:**
  Report data from a selected system are read out via the printer port (parallel interface). Any commercially available printer with a CENTRONICS parallel port can be used.
  Report number, system number and description, time and date, as well as measured values and type of measurement are printed from the test instrument to the report form. If several measurements were performed for each type of measurement, they are numbered consecutively.

- **Select a Report Form:**
  The user can select from amongst three report forms which have been loaded to the instrument.

- **Upload a Report Form from the PC:**
  The user can create personalized report forms. Report templates include header, text and footers. Report forms can be created at the PC and uploaded to the test instrument via the serial interface.

6.1 Print Values (PSI) / Print a Report



Select the desired command.

Select the desired system no.

Start printing. *

Status: A filled in file cabinet indicates that measurement data have already been stored for the selected system. The printer symbol appears during transmission of data to the printer.

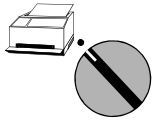
* Once a print job has been started, it can only be aborted by turning the function selector switch. An error message is read out if the printer does not work. The print job must be restarted in this case.

6.2 Selecting a Form for Report Printing

Selection can be made from amongst three previously stored report or print-out forms. Data are then laid out in accordance with the selected form, and are read out to an external printer.

Note

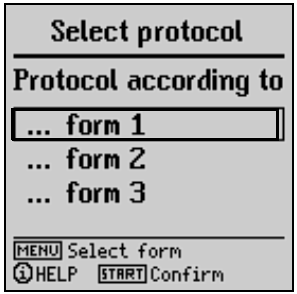
Three report forms are included with the instrument as a standard feature. GMC-I Messtechnik GmbH's address is printed into the header of these forms. Refer to the following chapter in order to modify these report forms.



Select the desired command.

Select a report form.

Acknowledge the selected report form.



6.3 Uploading a Report Form

Report and print-out forms can be generated and modified with the help of WinProfi software, and can be uploaded to the **PROFITEST 204+**. WinProfi software provides the user with a high performance editor to this end.

Note

Before uploading a report form, the header should be edited to fulfill your needs (see chapter 6.4.2, page 54). GMC-I Messtechnik GmbH's name and address are included in the header upon shipment from the factory.

Attention!

All measurement data stored to the test instrument are deleted when a print form is uploaded!

There are two recommended procedures for uploading report forms:

- 1. Upload the report form.
  2. Perform measurements.
  3. Print the report.

or

- 1. Perform measurements.
  2. Transmit and save measured values to a PC.
  3. Upload the report form.
  4. Transmit measured values back to the **PROFITEST 204+**.
  5. Print the report.

A Installing and Starting WinProfi at the PC

- Install the software as described in chapter 3.7.5, part A, if not already installed.
- Start WinProfi from the Windows start menu.

B Data Transmission Prerequisites

- Establish a connection between the PC and the test instrument. Use the Z3241 cable to this end which is included with the test instrument.
- Switch both devices on.

C Uploading Report Forms from the PC to the Test Instrument

Note: Forms can only be uploaded from the PC to the test instrument if they are located in the same directory as the WinProfi program files.

➪ *PC:* Select **Upload forms** in the **Reports** menu.

Follow the instructions which appear at the monitor.

D Generating Reports at the PC

Load form from PC
Downloading protocol forms via the serial interface
Please follow instruction manual exactly!
Transmitting ...

Note: The desired measurement values from the test instrument must be stored to the PC hard disc before reports can be generated at the PC.

The following steps are performed at the PC:

➪ Select **Print data** in the **File** menu.

➪ Select the desired file and acknowledge with OK.

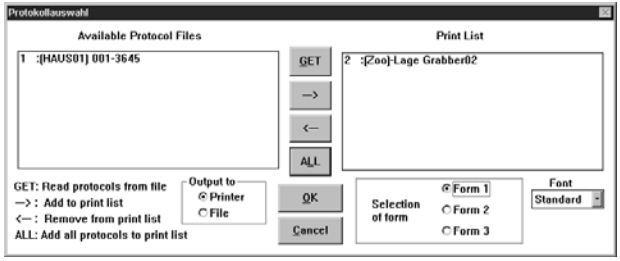
➪ Click the “Get” button in order to display all of the systems which have been saved to the selected file.

➪ Click the system to be printed out and then click the “→” button. The selected system appears in the print list. Several, or all systems, can be printed at once if desired, in which case a separate report is created for each system.

– Printing the Report

➪ Select the desired printer in Windows. The standard printer is always used. Printer settings can be changed to suit your specific needs with the **printer setup** function in the **System** menu.

➪ Select a report template and start printing by clicking the OK button.



Note: If the print-out does not fit into the page as desired, the font can be enlarged or reduced in size. With some printers the printer driver included with Windows must be used instead of the driver provided by the printer manufacturer.

– Print the report to a file and edit.

- Select the **Output to File** function instead of Output to printer. The NAME.XXX file is created automatically (XXX stands for the system number, which is entered automatically).
- Start the WinProfi editor from the Windows start menu.
- Open the NAME.XXX file. The file can be edited or as desired with the editor.
- Save your changes to the previously created file name, or to a new file with a different name.
- The report can be printed out with the print file function in the WinProfi editor.
- Close the editor with the **Exit** function in the file menu.

6.4 Report Form Generating Program

Report forms can be created and edited with WinProfi, or any other editor. The contents may also include functional characters for the utilized printer (tabs, margins etc.).

All three report forms can be subsequently uploaded to the test instrument with the help of WinProfi software.

6.4.1 List of Code Words and their Meanings

The positions at which measured values and other device information appear in the report are determined with place-holder code words. These code words always start with the "@" symbol for the purpose of identification.

@DATE	Prints the test date at the corresponding position within the text in European format, i.e. DD.MM.YYYY.
@TIME	Prints the time testing was performed at the corresponding position within the text in 24 hour format, i.e. HH:MM
@NAME	Prints the device ID at the corresponding position (**PROFITEST 204+** or OEM designation).
@SER	Prints the device serial number at the corresponding position in the following format: M 1234 5678.
@MAC	Prints out the system or machine number (3 digits).
@DESC	Prints out the system or machine description (up to 255 characters)

@VAL ( ) All measured values from a selected test for a given system which have been defined with @MAC.
The following assignments apply to the type of measurement, which must be indicated in parentheses:
1: Protective conductor test
2: Insulation test
3: Leakage current test
4: Voltage measurement
5: AC high-voltage test

The measured values and the parameters from the individual tests are printed out next to each other in a single line in the following order.
Additional text cannot be entered to the line, i.e. explanation or descriptions must be entered to the report either before or after the measured values.

Protective conductor test:
1: Max. voltage drop at the protective conductor
2: Max. protective conductor resistance value
3: Test duration for protective conductor test
4: Limit value for protective conductor voltage drop

Insulation test:
1: Insulation resistance value
2: Nominal test voltage
3: Insulation resistance limit value

Leakage current test:
1: Leakage current
2: Voltage at the test probes during measurement
3: Leakage current limit value

Voltage measurement:
1: Voltage at the test probes
2: Frequency
3: Time in seconds until discharge to less than 60 V
4: Time limit for discharge to less than 60 V

Voltage test:
1: Test voltage (measured value)
2: Test current
3: Test duration
4: Nominal test voltage
Any entered comment for the respective portion of the test is read out in the same line after the code words.

@BAD ( ) "Bad" measured values only, including all of their parameters and limit values in the same order as indicated under @VAL.
The user must decide whether or not testing was successful based upon this information. As is also the case with @VAL, the parameter in parentheses indicates the type of measurement. The worst value with reference to the limit value is always indicated, i.e. the "bad" values are not necessarily the highest or lowest values, but rather the worst with reference to the respective limit values for measurements with various limit values. @BAD can appear after @VAL, and can be used for a simple GO/NO-GO evaluation.
Any entered comment for the respective portion of the test is read out in the same line after the code words.

@NUM ( ) Number of stored measurements per type of measurement. The type of measurement is indicated in parentheses. The different types of measurement appear in the same order as is the case with @VAL.

@RESULT ( ) This code adds the word "bad" to the text, if at least one bad value has been measured for a given type of measurement, see @VAL ( ).

@RESULT (0) This code adds the word "bad" to the text, if at least one bad value has been measured for a given system.

Fully automated reports analysis is possible with the two @RESULT place-holder code words.

6.4.2 Report Layouts

The report header, the texts which appear between the measurement series, and the footer can all be freely changed for the creation of individualized report layouts.
Beyond this, the positions at which the measured values appear can be determined by the user, and these can be supplemented with the worst value, thus providing an improved overview. Time, date, utilized test instrument etc., can also be added at any desired position within the report.

The layout of the list which includes the measurement series is fixed and cannot be changed.

6.4.3 Uploading a Report Form to the Test Instrument

The various report forms have different maximum lengths:

Report form 1:	Full report, 16 kB, File name: PROTO_V1.PRN
Report forms : 2 and 3	Condensed report, 8 kB each File name: PROTO_V2.PRN and PROTO_V3.PRN

See chapter 6.3 for uploading instructions.

7 Characteristic Values

PROFITEST 204+

Measured Quantity	Measuring Range	Nominal Range of Use	Resolution	Nominal Voltage U_N	Open-Circuit Voltage U_0	Nominal Current I_N	Short-Circuit Current I_K	Internal Resistance R_I	Measuring Uncertainty	Intrinsic Uncertainty	Overload	
											Capacity	Duration
Protective Conductor Resistance R_{PC}	0 ... 85 mΩ	10 ... 330 mΩ	100 µΩ	—	12 V ~ SELV ungrounded	10 A [1]	12 A	—	±(8.6% rdg.+6 digits)	±(3% rdg.+5 digits)	Fuse: 16 A/1000 V Breaking capacity: 5 kA	
	85 ... 999 mΩ		1 mΩ									
	1.00 ... 9.99 Ω	1,00 ... 9,99 Ω	10 mΩ			—	—			±(3% rdg.+10 digits)		
	10.0 ... 25.0 Ω	10,0 ... 25,0 Ω	100 m Ω									
ΔU for Protective Conductor Test [2]	0 ... 9.99 V*	—	0.01 V	—		10 A	12 A	—	—	±(2% rdg.+3 digits)		
	10.0 ... 12.0 V		0.1 V			—	—			±(10% rdg.+3 digits)		
Insulation Resistance R_{INS}	0 ... 999 kΩ	0.050 ... 50 MΩ	1 kΩ	100/250/500/ 1000 V	max. 1.3 • U_N	1 mA	max. 1.6 mA	—	±(5.5% rdg.+4 digits) from 0.05 MΩ to 50 MΩ	±(3% rdg. +2 digits)	1200 V	cont.
	1.00 ... 9.99 MΩ		10 kΩ									
	10.0 ... 99.9 MΩ		100 kΩ									
	100 ... 499 MΩ	—	1 MΩ	250 V					—	±(8% rdg. +2 digits)		
				500/1000 V						±(5% rdg. +2 digits)		
	500 ... 999 MΩ		1 MΩ	500/1000V						±(10% rdg. +2 digits)		
	1 ... 3 GΩ		10 MΩ	1000 V						±(20% rdg. +2 digits)		
Leakage Current ΔI	0.00 ... 9.99 mA	0.2 ... 9.9 mA	0.01 m A	—	—	—	—	2 kΩ	±(8.6% rdg.+9 digits)	±(5% rdg.+5 digits)	250 V	cont.
Voltage U DC/AC	0.0 ... 99.9 V	1.0 ... 1000 V	0.1 V	—	—	—	—	20 MΩ	±(8.6% rdg.+9 digits)	±(5% rdg.+5 digits)	1200 V	cont.
	100 ... 999 V		1 V									
	1.00 ... 1.2 kV		0.01 kV									
Frequency f~	8.0 ... 99.9 Hz	10 ... 1000 Hz	0.1 Hz	—	—	—	—	20 MΩ	±(8.6% rdg.+2 digits)	±(2% rdg.+1 digit)		
	100 ... 999 Hz		1 Hz									

[1] up to a maximum of 330 mΩ

[2] With reference to 10 A nominal current

PROFITEST 204HP

	Nominal Range of Use	Reso-lution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	250 V ... 2.00 kV	1 V 10 V	±(5% rdg. + 5 digits)	±(2.5% rdg. + 5 digits)
Measured Qty. Current I AC	10.0 ... 250 mA	0.1 mA 1 mA	±(7% rdg.+ 5 digits)	±(5% rdg. + 5 digits)

PROFITEST 204HP-2.5kV

	Nominal Range of Use	Reso-lution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	250 V ... 2,5 kV	1 V 10 V	±(5 % rdg. + 5 digits)	±(2.5 % rdg. + 5 digits)
Measured Qty. Current I AC	10.0 ... 200 mA	0.1 mA 1 mA	±(7 % rdg. + 5 digits)	±(5 % rdg. + 5 digits)

PROFITEST 204HV

	Nominal Range of Use	Reso-lution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	650 V ... 1.00 kV 1.00 kV ... 5.00 kV	1 V 10 V	+2 ... –7% rdg. +2 ... –5% rdg.	0 ... –5% rdg. 0 ... –3% rdg.
Measured Qty. Current I AC	1.0 ... 10.0 mA	0.01mA 0.1 mA	±(7% rdg.+ 5 digits)	±(5% rdg. + 5 digits)

PROFITEST 204HV-5.4kV

	Nominal Range of Use	Reso-lution	Measuring Uncertainty	Intrinsic Uncertainty
Test Voltage U AC	650 V ... 1.00 kV 1.00 kV ... 5.35 kV	1 V 10 V	+2 ... –7% rdg. +2 ... –5% rdg.	0 ... –5% rdg. 0 ... –3% rdg.
Measured Qty. Current I AC	1.0 ... 10.0 mA	0.01mA 0.1 mA	±(7 % rdg.+ 5 digits)	±(5 % rdg. + 5 digits)

8 Setting Ranges for Parameters and Standard Values per DIN VDE

PROFITEST 204+

Measurement	Parameters	Charact.	Cross-Section	Lower Limit	Standard Value	Upper Limit	Special Setting Options
Protective Conductor Measurement	Test duration			1 s		120 s	Continuous measurement
	Limit value for protective conductor resistance based on phase conductor cross-section and characteristics of the overvoltage protection device (calculated value)		1.5 square mm 2.5 square mm 4.0 square mm 6.0 square mm 10 square mm 16 square mm 25 square mm 35 square mm 50 square mm 70 square mm 95 square mm 120 sq. mm	427 mΩ 293 mΩ 187 mΩ 141 mΩ 73.1 mΩ 73.1 mΩ 89.2 mΩ 114 mΩ 85.3 mΩ 48.5 mΩ 47.7 mΩ 34.3 mΩ		1.34 Ω 958 mΩ 726 mΩ 514 mΩ 261 mΩ 233 mΩ 174 mΩ 184 mΩ 123 mΩ 86.1 mΩ 83.9 mΩ 57.6 mΩ	
Insulation Resistance Measurement	Nominal voltage			100 V	500 V	1000 V	
	Resistance limit value			10 kΩ	1 MΩ	3 GΩ	
Leakage Current Measurement	Leakage current	ΔI		0.1 mA	2.0 mA	9.9 mA	
Voltage Measurement	Discharge time			1 s	5 s	9 s	
Voltage Test	Test duration			1 s	1 s	120 s	Continuous measurement
	Test voltage *			250 V / 650 V	—	**	
	Breaking current	I_{MAX}		10 mA / 0.5 mA	—	**	Pulse control mode
	Rise time			100 ms	—	99.9 s	

*Depending upon high-voltage module: HP or HV

Overvoltage Protection Device Characteristics for Limit Value Selection for Protective Conductor Testing

Display in Selection Menu	Explanation	Available for Cross-Section
Fuse t_B 5s Øphase cond. mm²	Fuse, break time: 5 s	All cross-sections
Fuse t_B 0.4s Øphase cond. mm²	Fuse, break time: 0.4 s	1.5 through 16 square mm
Type B 5xI_N0.1s Øphase cond. mm²	Circuit breaker, characteristic B, Ia = 5 x In - break time: 0.1 s	1.5 through 16 square mm
TypeC10xI_N0.1s Øphase cond. mm²	Circuit breaker, characteristic C, Ia = 10 x In - break time: 0.1 s	1.5 through 16 square mm
Adj.CB 8xI_N0.1s Øphase cond. mm²	Adjustable circuit breaker, Ia = 8 x In - break time: 0.1 s	All cross-sections

PROFITEST 204HP

Parameter	Lower Limit	Standard Value	Upper Limit	Special Setting Options
Test Duration	1 s	1 s	120 s	Continuous
Test Voltage	250 V	1 kV or 2 x U_N**	**2 kV**	
Breaking Current I_{MAX}	10 mA	—	**250 mA**	Pulse control mode
Rise Time	100 ms	1 s *	99.9 s	

* Recommended

** The highest value applies

** see following tables

PROFITEST 204HP-2.5kV

Parameter	Lower Limit	Standard Value	Upper Limit	Special Setting Options
Test Duration	1 s	1 s	120 s	Continuous
Test Voltage	250 V	1 kV or 2 x U_N**	**2.5 kV**	
Breaking Current I_{MAX}	10 mA	—	**200 mA**	Pulse control mode
Rise Time	100 ms	1 s *	99.9 s	

* Recommended

**The highest value applies

PROFITEST 204HV

Parameter	Lower Limit	Standard Value	Upper Limit	Special Setting Options
Test Duration	1 s	—	120 s	Continuous
Test Voltage	**650 V**	—	**5 kV**	
Breaking Current I_{MAX}	1 mA	—	10 mA	Pulse control mode
Rise Time	100 ms	1 s *	99.9 s	

* Recommended

PROFITEST 204HV-5.4kV

Parameter	Lower Limit	Standard Value	Upper Limit	Special Setting Options
Test Duration	1 s	—	120 s	Continuous
Test Voltage	**250 V**	—	**5.35 kV**	
Breaking Current I_{MAX}	0.5 mA	—	10 mA	Pulse control mode
Rise Time	100 ms	1 s *	99.9 s	

* Recommended

Reference Conditions

Line Voltage	230 V ± 1%
Line Frequency	50 Hz ± 0.1%
Waveshape	sine (deviation between effective and rectified values < 1%)
Ambient Temperature	+ 23 °C ± 2 K
Relative Humidity	40% ... 60%
Load Impedance	ohmic

Nominal Ranges of Use

Line Voltage	207 V ... 253 V
Line Frequency	45 Hz ... 65 Hz
Line Voltage Waveshape	sine
Temperature Range	0 °C ... + 40 °C

Ambient Conditions

Storage Temperature	– 20 °C ... + 60 °C
Operating Temperature	– 5 °C ... + 40 °C
Accuracy	0 °C ... + 40 °C
Max. Relative Humidity	75%, no condensation allowed
Elevation	to 2000 m

Power Supply

Line Voltage	207 V ... 253 V
Line Frequency	45 Hz ... 65 Hz
Power Consumption	**204:** approx. 180 VA *without accessories* **204HP:** max. 700 VA **204HV:** max. 100 VA
Max. Leakage Current	0.5 mA *basic device and 204HP or HV*
Power Consumption	max. 6 A *basic device and 204HP or HV*

RS 232 Interface

Type	RS 232C, serial, per DIN 19241
Format	9600, 8, N, 1
Connector	9-pin sub-miniature socket

Electrical Safety

Safety Class	**204:** II **204HP/HV:** I per IEC 61010-1 / EN 61010-1 / VDE 0411-1
Line Voltage	230 V
Test Voltage, **204**	5.55 kV 50 Hz
Test Voltage, **204HP/HV**	mains / PE / key switch / external signal lamps to high-voltage measuring terminals: **204HP:** 5 kV AC 50 Hz **204HV:** 8 kV AC 50 Hz mains to PE: 1.5 kV AC mains to external signal lamps: 1.5 kV AC
Measuring Category	II
Contamination Degree	2
Safety Shutdown	if instrument overheats
Fuses	**204:** mains: T 1.6 / 250 test probe: T16 / 1000 **204HP/HV:** mains: F 3.15 / 250

Electromagnetic Compatibility (EMC) PROFITEST 204+

Product Standard EN 61326-1:2006

Interference Emission		Class
EN 55022		A
Interference Immunity	Test Value	Performance Feature
EN 61000-4-2	Contact/atmos. - 4 kV/8 kV	A
EN 61000-4-3	10 V/m	B
EN 61000-4-4	Mains Connection - 2 kV	B
EN 61000-4-5	Mains Connection - 1 kV	A
EN 61000-4-6	Mains Connection - 3 V	A
EN 61000-4-11	0.5 period / 100%	A

Note
This is a class A device. This device may cause radio interference in residential areas.
If this is the case, the owner may be required to implement appropriate corrective measures.

Mechanical Design

Protection	IP 40 per DIN VDE 0470, part 1/ EN 60529
Dimensions	**Basic instrument 204:** (WxDxH) 255 mm x 133 mm x 240 mm **Basic instrument (204) and high voltage module (HP or HV) mounted on caddy:** (WxDxH) 380 mm x 250 mm x 650 mm
Weight	**204:** approx. 5.1 kg **204HP/HV:** approx. 8 kg

9 Data Interfaces

9.1 RS 232 Serial Interface

The data interface socket (5) is used to connect the **SECUTEST SI+** module (accessory), which can be set into the lid of the **PROFITEST 204+**.
The same interface can be used to exchange data with an IBM compatible PC.

Pin 9 may not be short-circuited with pin 5!

9.1.1 Software Analysis of Measurement Results

The included software allows for the convenient generation of reports forms at the PC, and uploading to the test instrument.

9.1.2 Interface Definition and Protocol

The **PROFITEST 204+** interface complies with the RS 232 standard.

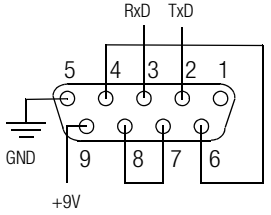
Technical Data:

Baud Rate	9600 baud, fixed
Character Length	8 bits
Parity	none
Stop Bits	1
Data Protocol	per DIN 19244 X_ON / X_OFF

All **PROFITEST 204+** operating functions can be remote controlled via this interface. Signal and display values can be read out as well.
A description of the interface protocol, as well as a list of commands and syntax, is available upon request from GMC-I Messtechnik GmbH.

9.1.3 Connector Pin Assignments

1: NC
2: TxD (view, SI)
3: RxD (view, SI)
4: NC → 6
5: GND
6: NC → 4
7: NC → 8
8: NC → 7
9: +9 V

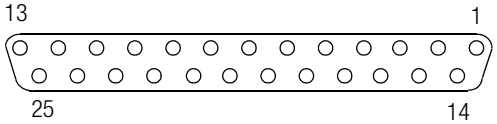


9.2 Parallel Interface (printer port)

Any commercial printer with a CENTRONICS parallel port can be connected to this interface (4). Prerequisite: the printer includes internal character sets, pure Windows printers do not work. Comprehensive reports can be printed out which have been created with the included software.

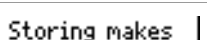
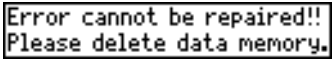
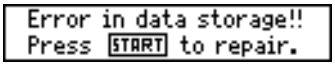
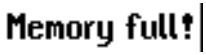
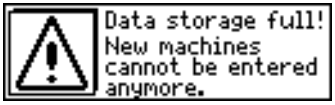
9.2.1 Connector Pin Assignments

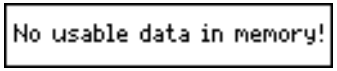
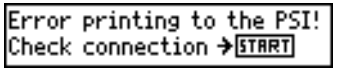
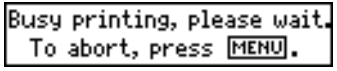
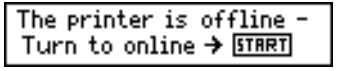
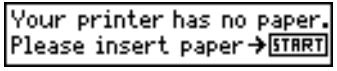
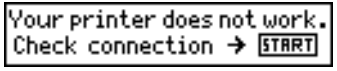
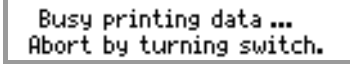
1: $\overline{\text{Strobe}}$
2...9: D0-D7
10: $\overline{\text{ACK}}$
11: BUSY
12: Paper empty
13: NC
14: NC
15: Fault
16: Init printer
17: NC
18...25:GND



10 Signals / Error Messages, Causes and Remedies

Signal / Error Message	Meaning / Cause	Remedy
PROFITEST 204+ Basic Instrument		
Test Sequence		
Testing ...	The stopwatch is displayed during protective conductor measurement.	
Discharging the residual voltage	The falling voltage value is continuously displayed until residual voltage has reached a value of less than 60 V.	
Residual voltage less than 60V!	All-clear signal after insulation testing: Voltage at test probe is less than 25 V or 60 V, depending on measuring function.	
Test OK !	The test was passed.	
Test failed !	Test results are not within allowable limit values.	
LCD is not illuminated	– Power cable not plugged in – Mains fuse is blown	– Plug in power cable, see chapter 3.3, page 17 – Replace mains fuse, see chapter 11.1.1, page 66
Protective conductor and insulation measurement cannot be performed	– Fuse integrated into test probe is blown	– Replace fuse in test probe, see chapter 11.1.2, page 66
Temperature too high, wait 10 min	Continuous operation during protective conductor test	Allow instrument to cool for approximately 10 minutes
	Indicates type of voltage applied: alternating voltage superimposed with direct voltage – direct voltage – alternating voltage	
External voltage on probe tips!	Protective conductor and insulation measurements: Interference voltage is present at the test probes and the measurement will be aborted. If protective conductor testing is started with an interrupted protective conductor, a voltage may be induced capacitively. This voltage is recognized as an interference voltage by the instrument .	

Signal / Error Message	Meaning / Cause	Remedy
	Warning for leakage current test: Voltage may not exceed 250 V.	
	Indication that test current is less than 10 A.	
	Warning regarding a source of danger, **e.g. voltage at the test probe is greater than 25 V**	
	This symbol appears after the measured voltage value has been frozen at the display (see chapter 4.4, page 33).	
Database Operations		
	– No measurement has been performed – Measurement results have already been saved – The remote control key (7) was pressed and held longer than required	
	See displayed text	See displayed text
	An error has occurred while saving data to memory.	Save data to a PC and then clear the memory.
	See displayed text	See displayed text
	The memory is not longer able to store additional measurement data.	Save data to a PC and then clear the memory.
	See displayed text	Transmit data to a PC or print data out, and then delete any unnecessary systems, or clear the memory entirely.
	No data have yet been saved to this data record.	

Signal / Error Message	Meaning / Cause	Remedy
	Printing is not possible	Check the printer connector cable and make sure that there is paper in the printer. Check to see if an error has occurred at the printer.
	Data are being transferred to the printer. The printer may not start printing until data transmission has been completed.	
	A data box with records indicates that measurement data have already been saved for the selected system.	
	The data record for a given system has been deleted.	
	The printer does not function.	Check the data record.
	The printer is functioning incorrectly.	Check the connection between the printer and the **PROFITEST 204+**, and then press the START key.
	The printer is functioning correctly.	Press the MENU key in order to abort printing.
	The printer does not function.	Switch the printer to online, and then press the START key.
	The printer does not function.	Add paper to the printer, and then press the START key.
	The printer does not function.	Check the connection between the printer and the **PROFITEST 204+**, and then press the START key.
	The printer is functioning correctly.	Turn the switch in order to abort printing.

Signal / Error Message	Meaning / Cause	Remedy
Change to voltage measuremnt	The current value for the contact current measurement is not within the allowable measuring range. The instrument is switched to voltage measurement: it must be assumed that dangerous contact voltage is present.	
Stored	The measurement has been saved to memory.	
	Data management message: Data transmission has been successfully completed.	
PROFITEST 204HP/HV High-Voltage Module		
PROFITEST 204 HP max. 2kV, 250mA	The displayed high-voltage module has been detected.	Switch the device on with the key switch.
PROFITEST 204 HV max. 5kV, 10mA	The displayed high-voltage module has been detected.	Switch the device on with the key switch.
PROFITEST 204 HV/ HP not found! **Green signal lamps are not illuminated**	The displayed high-voltage module has not been detected: – Power cable not plugged in – Key switch set to „0“ – Blown fuse – Defective signal lamp	Connect the high-voltage module: – Plug in power cable, see chapter 3.4, page 17 – Set key switch to “I” – Replace fuse – Replace signal lamp
PROFITEST 204 HV/ HP not found! **Red signal lamps are not illuminated**	– Faulty data exchange between **PROFITEST 204+** and 204HP/HV – Defective signal lamp	– Refer to following error message: “Defective instrument!” – Replace signal lamp, see chapter 11.5.2, page 67
	Current measured during the test was capacitive to a given extent. The larger the dimensions of the device under test, the greater the capacitive current.	
	Current measured during the test was primarily ohmic. However, it must nevertheless be assumed that leakage current is present which, under momentary conditions, does not exceed the selected limit value. However, this situation may change over a period of time.	
Defective instrument!	Faulty data exchange between **PROFITEST 204+** and 204HP/HV. – Instruments mounted to one another incorrectly – After a lamp has been replaced: The reflectors were not re-installed	– Check connections at both instruments – Check to see if the signal tubes are covered – Install the reflectors – Clean dust or contamination from the transmitter and receiver diodes at the bottom of the basic instrument, see chapter 11.5.1, page 67

Signal / Error Message	Meaning / Cause	Remedy
	High-voltage module can be switched on.	
	High-voltage present at the test probes during measurement **Do not touch the test probes!**	
	The specified limit value I_{MAX} has been exceeded. The current limiting function has switched the instrument to the “standby” mode.	
	Test completed successfully: residual voltage less than 25 V	
Temperature too high, wait 10 min	Continuous operation with high power during high-voltage testing	Allow the instrument to cool down for approximately 10 minutes
Internal temperature monitoring is defective.	Hardware error	Send the high-voltage module to the GMC-I Service GmbH Repair and Service Department
Red lamp defect. Please replace !	One of the signal lamps at the high-voltage module is defective.	Refer to chapter 11.5.2, page 67 regarding replacement.

11 Maintenance

Safety features should be inspected and documented at least once a year by the repair department at GMC-I Service GmbH to assure flawless functioning and efficiency.

11.1 Replacing Fuses

Attention!
Disconnect the instrument at all poles from the measuring circuit before opening any of the fuse cartridges! Disconnect the instrument from the mains.

Attention!
Use **specified original fuses** only!
Short-circuiting or repairing fuses is prohibited!
The instrument may be damaged if **fuses** with other current ratings, breaking capacities or triggering characteristics are used!

11.1.1 Replacing the Mains Fuse

- Open the fuse cartridge with a suitable tool (e.g. a screwdriver).
- Replace the blown fuse with a new fuse with the same characteristic values.
- Close the fuse cartridge.

11.1.2 Replacing the Measuring Circuit Fuse in the Test Probe at the PROFITEST 204+

Danger: High-Voltage!
If non-specified fuses are used in the **measuring circuit** (test probe), operator error may be life endangering (danger of short-circuiting)!

- Remove the cover with the 3 screws from the test probe with a suitable tool (screwdriver).
- Replace the blown fuse with a new fuse with the same characteristic values (T16/1000).
- Reassemble the test probe.

11.2 Housing and Test Probes

No special maintenance is required. Keep outside surfaces clean **and dry**. Use a slightly dampened cloth for cleaning. Avoid the use of cleansers, abrasives or solvents.

Attention!
Condensation at the high-voltage module, the test cables and the device under test must be prevented, because high-voltage might otherwise result in surface leakage current. Insulated components may also conduct high-voltage if condensation is present.

11.3 PROFITEST 204+ Measurement Cables

Inspect the measurement cables for mechanical damage at regular intervals.

11.4 PROFITEST 204HP/HV Test Cables

Wind the test cables around the reels at the back of the transport caddy (option) after each use, if the caddy is used. The test cables may not, under any circumstances, be mechanically damaged or kinked, because insulating capacity may otherwise be impaired.

Inspect the test cables and the high-voltage pistols for mechanical damage before placing the high-voltage module into service, each time it is used.

Attention!
Test cables and high-voltage pistols which demonstrate even minimal damage should be sent immediately to the Repair and Replacement Parts Department at GMC-I Service GmbH.

11.5 Repair, Parts Replacement and Instrument Balancing

When the instrument is opened, voltage conducting parts may be exposed. The instrument must be disconnected from the measuring circuit for repair, replacement of parts or balancing. If repair or balancing of a live, open instrument is required, this may only be carried out by trained personnel who are familiar with the dangers involved.

11.5.1 Cleaning the Transmitter and Receiver Diodes

If the **PROFITEST 204+** basic instrument is operated for a lengthy period of time without a high-voltage module, the transmitter and receiver diodes may become dusty. Before mounting a high-voltage module to the basic instrument, unscrew and remove the bottom cover (2 Phillips head screws in the middle) and clean the four diodes with a soft brush. Replace the bottom cover and retighten the screws.

11.5.2 Replacing Signal Lamp Bulbs, Disconnecting the High-Voltage Module

In order to replace the signal lamp bulbs, the high-voltage module must first be disconnected from the basic instrument.

Attention!
Before dismantling the basic instrument and the high-voltage module, both must be disconnected from the mains and from the measuring circuit.

- Close the lid at the basic instrument.
- Turn the instrument combination upside down and set it onto a soft surface, in order to avoid scratching the lid.
- Unscrew the four threaded rods with a 4.5 mm screwdriver (remove two rubber feet first, see chapter 3.1.1).
- The high-voltage module can now be lifted away.
- Set the high-voltage module onto the floor on its feet.
- Loosen the hex nut inside the instrument at the respective reflector (8 mm width across the flats).
- Remove the reflector.
- Remove the defective bulb from the bayonet fixture and install a new bulb: 12 to 15V / 2W with BA9s base, e.g. OSRAM Miniwatt T10 no. 3453B.
- Replace the reflector.
- Mount the high-voltage module to the basic instrument as described in chapter 3.1.1.

11.5.3 Replacing Bulbs at the External Signal Lamps

Attention!

Before replacing bulbs at the external signal lamps:
– Disconnect the external signal lamps from the terminals (3) at the high-voltage module

or

– Disconnect the high-voltage module from the mains and from the measuring circuit

- ➪ Unscrew the red or the green cap by turning counterclockwise.
- ➪ Remove the defective bulb from the bayonet fixture and install a new bulb: 12 to 15V / 2W with BA9s base, e.g. OSRAM Miniwatt T10 no. 3453B.
- ➪ Replace the cap and tighten by turning clockwise.

11.6 Software

Device software for the test instrument can be updated via the RS 232 interface with the help of a PC with a CD-ROM drive, and an interface cable.
The software update is loaded to the flash EPROM at the **PROFITEST 204+** basic instrument.

The file containing the desired software version can be uploaded to the test instrument via the serial interface with the help of the update function included with WinProfi software. The previously installed software is overwritten.

Data Transmission Prerequisites

- ➪ Establish a connection between the PC and the **PROFITEST 204+**.
- ➪ Switch both devices on.

Proceed as described in chapter 3.7.5, page 23.

11.7 Recalibration

The respective measuring task and the stress to which your measuring instrument is subjected affect the ageing of the components and may result in deviations from the guaranteed accuracy.

If high measuring accuracy is required and the instrument is frequently used in field applications, combined with transport stress and great temperature fluctuations, we recommend a relatively short calibration interval of 1 year. If your measuring instrument is mainly used in the laboratory and indoors without being exposed to any major climatic or mechanical stress, a calibration interval of 2-3 years is usually sufficient.

During recalibration* in an accredited calibration laboratory (DIN EN ISO/IEC 17025) the deviations of your instrument in relation to traceable standards are measured and documented. The deviations determined in the process are used for correction of the readings during subsequent application.

We are pleased to perform DAkkS or factory calibrations for you in our calibration laboratory. Please visit our website at www.gossenmetrawatt.com (→ Company → DAkkS Calibration Center or → FAQs → Calibration questions and answers).

By having your measuring instrument calibrated regularly, you fulfill the requirements of a quality management system per DIN EN ISO 9001.

11.8 Device Return and Environmentally Compatible Disposal

The instrument is a category 9 product (monitoring and control instrument) in accordance with ElektroG (German Electrical and Electronic Device Law). This device is subject to the RoHS directive. Furthermore, we make reference to the fact that the current status in this regard can be accessed on the Internet at www.gossenmetrawatt.com by entering the search term WEEE.

We identify our electrical and electronic devices in accordance with WEEE 2012/19/EU and ElektroG with the symbol shown to the right per DIN EN 50419 .

These devices may not be disposed of with the trash. Please contact our service department regarding the return of old devices.

If you use batteries or rechargeable batteries in your instrument or accessories which no longer function properly, they must be duly disposed of in compliance with the applicable national regulations.
Batteries or rechargeable batteries may contain harmful substances or heavy metal such as lead (PB), cadmium (CD) or mercury (Hg).

They symbol shown to the right indicates that batteries or rechargeable batteries may not be disposed of with the trash, but must be delivered to collection points specially provided for this purpose.

* Verification of specifications or adjustment services are not part of the calibration. For products from our factory, however, any necessary adjustment is frequently performed and the observance of the relevant specification is confirmed.

12 Appendix

12.1 Checklist for the High-Voltage Test

Protective Measures for Personnel

- Switch the machine off and secure against switching back on.
- Perform protective conductor and insulation resistance tests.
- Make sure that the system is grounded.
- Secure the danger zone with barriers. Even narrow points of access must be blocked.
- Post warning signs in a clearly visible fashion.
- Set up warning lamps in a clearly visible fashion.
- Attach the emergency stop switch in a clearly visible fashion.
- Warn personnel working in the area of possible danger.
- If the operator leaves the work area, the test instrument must be switched off with the key switch, and the key must be removed from the lock.

Protective Measures for the Machine (recommended)

- Review the electrical diagram and make a note of all electrical circuits.
- Disconnect the neutral conductor from the mains.
- Short circuit all electrical circuits to themselves.
- Disconnect surge diverters from control current circuits, if these would be triggered by test voltage.
- Disconnect PELV circuits (high-voltage testing is not required here).
- Test insulation at all circuits with 1000 V. (If insulation resistance is OK with 1000 V, the high-voltage test should be successful as well).
- Disconnect the converter.
- **Attention in TN systems!**
  In these systems, the protective conductor is connected with the neutral conductor in the terminal box. High-voltage is therefore present between the phase conductors and the neutral conductor.
  If necessary, the neutral conductor must be separated as it is not disconnected from the mains by any fuse.

Set Up the Test Instrument

See chapter 8, *"Setting Ranges for Parameters and Standard Values per DIN VDE"*.

High-Voltage Test

- Test all circuits (conductors) against the protective conductor (all switches within the system circuit must be switched on, and testing must be performed upstream and downstream from relays).
- Remove all short-circuiting after the test.

Performing the Test without Short-Circuiting

- Test all conductors from all circuits separately against the protective conductor (if flashover occurs, the machine may be damaged).

Functions Test

- The machine must be tested for correct functioning, especially as regards safety functions, after high-voltage testing.

12.2 Minimum Display Values in Consideration of Operating Error

Table for the calculation of minimum display values for protective conductor resistance, insulation resistance and differential current in consideration of instrument operating error:

R_{PC} [mΩ]		R_{ins} [MΩ]		ΔI [mA]	
Limit Value	**Max. Display**	**Limit Value**	**Min. Display**	**Limit Value**	**Max. Display**
11	10	0	0.05	0.31	0.2
22	20	0.03	0.1	0.36	0.25
33	30	0.08	0.15	0.42	0.3
44	40	0.12	0.2	0.52	0.4
55	50	0.17	0.25	0.63	0.5
66	60	0.21	0.3	0.74	0.6
77	70	0.31	0.4	0.85	0.7
88	80	0.40	0.5	0.96	0.8
104	90	0.49	0.6	1.07	0.9
115	100	0.58	0.7	1.18	1.0
125	110	0.67	0.8	1.72	1.5
136	120	0.76	0.9	2.26	2.0
147	130	0.85	1.0	2.81	2.5
158	140	1.31	1.5	3.35	3.0
169	150	1.77	2.0	4.43	4.0
180	160	2.23	2.5	5.52	5.0
191	170	2.68	3.0	6.61	6.0
201	180	3.60	4.0	7.69	7.0
212	190	4.51	5.0	8.78	8.0
223	200	5.42	6.0	9.86	9.0
234	210	6.34	7.0		
245	220	7.25	8.0		
256	230	8.17	9.0		
267	240	8.54	10		
278	250	13.1	15		
288	260	17.7	20		
299	270	22.3	25		
310	280	26.8	30		
321	290	36.0	40		
332	300	45.1	50		

12.3 List of Abbreviations

Abbreviation	Meaning
ΔI	Contact current for leakage current test
ΔU	Voltage drop during protective conductor test
f~	Frequency of measuring voltage
I_{MAX}	Maximum permissible current before high voltage is switched off
I_N	Nominal current
I_T	Breaking current for high-voltage test
PELV	Protective Extra Low Voltage
SELV	Safety Extra Low Voltage
R_{INS}	Insulation resistance
R_{PC}	Protective conductor resistance
U_{INS}	Test voltage
U⎓	Measuring voltage
U_T	Voltage value prior to exceeding the breaking current during high-voltage testing

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13 Repair and Replacement Parts Service Calibration Center * and Rental Instrument Service

When you need service, please contact:

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Service Center
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90471 Nürnberg • Germany
Phone +49 911 817718-0
Fax +49 911 817718-253
E-Mail service@gossenmetrawatt.com
www.gmci-service.com

This address is only valid in Germany.
Please contact our representatives or subsidiaries for service in other countries.

* **DAkkS Calibration Laboratory for Electrical Quantities D-K-15080-01-01 accredited per DIN EN ISO/IEC 17025:2005**
Accredited measured quantities: direct voltage, direct current values, DC resistance, alternating voltage, alternating current values, AC active power, AC apparent power, DC power, capacitance, frequency and temperature

Competent Partner
GMC-I Messtechnik GmbH is certified in accordance with DIN EN ISO 9001:2008.
Our DAkkS calibration laboratory is accredited by the Deutsche Akkreditierungsstelle GmbH (National accreditation body for the Republic of Germany) in accordance with DIN EN ISO/IEC 17025:2005 under registration number D-K-15080-01-01.

We offer a complete range of expertise in the field of metrology: from **test reports** and **proprietary calibration certificates** right on up to **DAkkS calibration certificates**.
Our spectrum of offerings is rounded out with free **test equipment management**.
An **on-site DAkkS calibration station** is an integral part of our service department. If errors are discovered during calibration, our specialized personnel are capable of completing repairs using original replacement parts.
As a full service calibration laboratory, we can calibrate instruments from other manufacturers as well.

14 Product Support

When you need support, please contact:

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